

WORKING PAPER 450

CHILD LEUKAEMIA AROUND SELLAFIELD:  
LOCAL COMMUNITY ATTITUDES AND THE BLACK REPORT

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1. Introduction
2. Contextual points
  - 2.1 The Black Inquiry
  - 2.2 Policy context
  - 2.3 A local survey
  - 2.4 Contemporary events
  - 2.5 Local perceptions of 'risk'
  - 2.6 Local contact with Black
3. Local reactions to the findings and presentation of Black
  - 3.1 The empirical basis
  - 3.2 The detailed schedule of responses
    - 3.2.1 The methodology of compilation
    - 3.2.2 Analysis of statements
    - 3.2.3 Preliminary evaluations
  - 3.3 An aggregated analysis
    - 3.3.1 The aggregation of statements into topics: methodology
    - 3.3.2 Ranked topic frequencies
    - 3.3.3 Topic response patterns
  - 3.4 Topic response patterning according to expressed concerns
    - 3.4.1 Background
    - 3.4.2 Topic patterning according to responses about personal RIHR
    - 3.4.3 Topic patterning according to responses about other adult RIHR
    - 3.4.4 Topic patterning according to responses about child RIHR
    - 3.4.5 Topic patterning according to responses about beach radiation levels
    - 3.4.6 Topic patterning according to responses about fish and seafood radiation levels

4. Closing comments

References

## Appendices

- A. Views on discharge incident
- B. Views on cancer excess
- C. Views on YTV programme
- D. Views on why Black commissioned
- E. A selection of complete responses to Black Report question

## Introduction

Public concern about pollutants in the environment and their potentially harmful effect on man is a phenomenon of growing significance. It calls for the development of more adequate understanding both of the nature of people's concerns and of the relevance to concerned communities of actions and decisions of authorities acting on their behalf to assess and control the sources of perceived or potential threat.

One of the most significant recent instances in the UK of public concern over feared local environmental pollution effects centred on British Nuclear Fuels' (BNF) spent fuel reprocessing operations at Sellafield in Cumbria (otherwise known as Windscale). Considerable controversy arose around a television broadcast in November 1983 drawing attention to the increased incidence of leukaemia in children in Sellafield's vicinity (Windscale, the Nuclear Laundry, YTV). Radiation is the only known cause of leukaemia within the limits of present knowledge and Sellafield discharges greater quantities of radioactivity than any other installation in the UK. Viewers were left to draw their own conclusions as to whether there might be a causal link between the discharges from Sellafield and the local excess of leukaemia.

Government responded to the programme with significant speed in setting up a high level inquiry under the eminent medical scientist Sir Douglas Black. The inquiry's purpose has been widely interpreted as being partly to 'find out the facts' and partly to assuage public opinion. Its report, published within nine months of the convening of the inquiry, stands as the foremost expert statement on the highly sensitive issue of whether children near Sellafield are environmental victims of nuclear power (Black, 1984).

Though tempered with the recognition of various uncertainties and identifying a need (with corresponding recommendations) for more research into the issues that had been investigated, the report's overall conclusion, and the basis of current action by authorities, was that a 'qualified reassurance' could be given to people who are concerned about a possible health hazard in the neighbourhood of Sellafield. The message of reassurance was repeatedly stressed by Sir Douglas in a large number of mass media statements following the publication of the report (Walker and Macgill, 1985).

The purpose of this paper is to evaluate the relevance of the Black Report to the communities whose situation it was primarily addressing - the communities of the towns and villages around Sellafield in West Cumbria. We will be concerned (1) with examining in what ways and to what extent the Black Report was received by these communities, (2) with examining the extent to which these communities were reassured by the report's message (and, prior to that, in need of reassurance); and, (3) with revealing and examining the terms in which local people themselves speak about the report and related issues. Through a comprehensive linguistic analysis of these aspects we are concerned, inter alia, to recast the research priorities and methodology of work on risk 'perception'. The analysis and evaluation below draws on an original local attitude survey and is set against a number of contextual points.

## 2. Contextual points

### 2.1 The Black Inquiry

The inquiry's terms of reference were very broad: "To look into the recently published claims of an increased incidence of cancer in the vicinity of the Sellafield sites:

- (1) examine the evidence concerning the alleged cluster of cancer cases in the village of Seascale,
- (2) consider the need for further research,
- (3) and make recommendations"

In practice, term (1) was expanded to include an examination not only of the epidemiological evidence, but also of radiobiological evidence as to the existence, or otherwise, of a possible link between BNF discharges and the pattern of incidence of leukaemia. From the survey of epidemiological evidence there emerged the important conclusion that four leukaemia deaths among under 15 year olds in Seascale between 1968-1982 represented a real abnormality in the incidence pattern of leukaemia for the nation as a whole. They were to be described as constituting an 'excess' - too long lived in their time scale to be described merely as a cluster, and suggestive of an effect of some regularly operating cause. Though seemingly vindicating the disclosures of the television programme the conclusion was heavily qualified; the local excess being described as 'unusual but not unique to the area'.

From the radiobiological evidence, particularly information on known emissions and discharges from BNF and from the report's models for the pathways and uptake of radiation that causes leukaemia, it was estimated that no more than 0.1 of a death from leukaemia would be expected from the discharges (accidental and planned) from Sellafield in the under 20 year old population of Seascale born between 1945-1975.

"... This is approximately  $\frac{1}{40}$  of the additional number (namely four) of deaths found at Seascale ... to attribute additional deaths from leukaemia to radiation it would require that the total discharges from the Sellafield site had in fact been at least 40 times greater than reported, and monitoring and extrapolation of doses to the public were in error by a similar

factor". A 'safety factor' of 40, then, is portrayed as a large buffer to absorb residual uncertainty, generated from the discrepancy between the 0.1 predicted and four observed leukaemia deaths. (This particular line of reasoning has been strongly criticised).

Considerable uncertainty in the scientific evidence and scope for further studies to improve the 'state of the art' were identified. The reassurance was accordingly qualified, and research studies proposed. The Black Report, then, must properly be acknowledged as being an interim report.

## 2.2 Policy context

The issues around which Sir Douglas Black's Inquiry was convened were clearly of considerable public policy significance. It is instructive to distinguish four of the linked policy problems that were at stake. First, as authorising agents for BNF's discharges, government<sup>(DoE)</sup> were faced with a need to respond to the allegation of condoning the imposition of a pollution hazard on a local population. Second, there were matters related to their (DHSS) guardian responsibilities over the state of that community's health. Third, they were faced with a germ of considerable public anxiety and concern (accompanied by considerable additional weight to the cause of the anti-nuclear environmental lobby) - the spectre of childhood victims of nuclear power - calling for solidly based reassurance to those concerned. Fourth there was the potential for very considerable political and economic ramifications throughout the nuclear industry if BNF could not be scientifically exculpated from the 'charge' of causing these leukaemia deaths.

On the face of it, the reassuring conclusion of the Black Report might seem to provide a satisfactory resolution for each of the above policy difficulties. Here was expert opinion that government was not authorising undue risk (though, at the same time, there was recognised to be <sup>an</sup> urgent need to tighten up the official discharge authorisations), and that there was no cause for undue concern about the state of the community's health.

A direct reassurance was also being given to concerned communities - potentially all the more valuable for coming from such an eminent and respected source. And the threat of serious ramifications throughout the nuclear industry was removed.

But the immediate acceptance of such an apparently satisfactory outcome is not open to those who require the reassurance to be (a) solidly underpinned by hard and conclusive scientific reasoning, and (b) well received by the communities about which it speaks and to whom it is primarily addressed. For these additional requirements there is a need first to assess the outcome of the Black Inquiry against (a) what constitutes proper scientific method and conclusive result, and (b) methodologically sound and empirically based analysis of local public opinion.

Elsewhere (Macgill, Ravetz and Funtowicz, 1985) we have evaluated the Black Report on the first of these counts (a), and can here simply draw attention to two issues: first to observations made about the inherent contradiction of a reassurance which is heavily qualified with urgent recommendations for more research and for tighter controls; and second to the legacy of controversy in the scientific community, where much to dispute in the epidemiological and radiobiological components of the Black Inquiry has been found. We are driven then to reflect upon what might be called the ritual aspect of inquiries where it is the deemed credibility and legitimacy of the proceedings in the public eye, rather than hard substantive content, through which meaning (and in the present case, reassurance), is or is not attained.

In the present paper we will concentrate on the second of the requirements (labelled (b) above), and in the light of a relative lack of acceptance of the Black Report amongst the people whose situation it was primarily addressing, will in turn reflect (1) on the impotence and almost irrelevance to the policy process of communities who are so removed from the axis of technical and policy-making power (and the hollow resonance thereby characterising the reassurance), (2) on the false equation of lack of noticeable public dissent with received assent (a public being addressed, not consulted, and faced with a document that is very much about them,



but to which they have difficulty in relating), and (3) on the enormity of the task of achieving reassurance and reconciliation among communities displaying some rather contrasting ways of looking at the issues.

### 2.3 A local survey

A recently undertaken social survey is to be used as the primary basis for understanding the relevance of the Black Report to local communities. It was undertaken in December 1984, just over a year after the controversial television broadcast and four months after the publication of the Black Report. The survey area extended over a random sample of 462 people in the villages and towns in the six Parish Councils referred to in the Black Report (see Figure 1)\*. A sampling ratio of approximately 1 in 40 of the adult population was taken except for Seascale, where the higher ratio of 1 in 15 was deliberately chosen. Seascale, then, was the focal point of the survey - following its designation as a centre of interest in the television programme and in related subsequent mass media reportage.

The local area in which the survey was undertaken can be economically, socially and culturally identified with the presence of Sellafield as the primary local institution. It is not merely the spatial domain of primary relevance to the issues raised in the YTV programme and investigated by Black, but, more fundamentally a locality in which discourse about issues are talked about, moreover, is conditioned by the everyday experience of Sellafield employees (a workforce currently in excess of 10,000, predominantly living locally), this in turn being disseminated into social networks and embedding itself in the local vernacular.

The roots of possible concern over risk issues highlighted in the YTV programme and addressed by Black are buried far deeper than the circumstances and revelations of these two individual (although linked) 'events'. Similarly the roots of rejection of risk concern. The position and relevance of 'risk' in the area,

\*There was a relatively low rate of refusal on the part of local people who were approached to participate in the survey. It was for many an unusual opportunity for them to participate in a debate which was very much about them, but from which they had been excluded. Others, though, participated on what was initially a more sceptical basis.

is living exemplification of Wynne's general observation that 'risk' is seen as but one facet of conceptions about technology and industry (in this case, nuclear reprocessing) which are set within an historically changing and transforming framework of social values, meanings and cultures. And, as we have elaborated further in a companion paper to this one (Macgill and Berkhout, 1985), we understand that it is not a definite phenomenon called 'risk' that is conceived of by individuals in West Cumbria when thinking about the incidence of child leukaemia, but those patent manifestations of the structures (institutional and technological) within which hazard (for want of a better word) may be a possibility.

#### 2.4 Contemporary events

November 1983 saw not only the drama of the YTV programme and the convening of the Black Report Inquiry, but also what was disclosed as one of the most serious operating errors in the history of BNF's operations at Sellafield. A tank of radioactive effluent which should have been held for further reprocessing was discharged into the sea and materials bearing unusually high quantities of radioactivity were subsequently washed by the tides onto local beaches. Central Government responded to this incident by issuing advice to the public (and apparently to the dismay of local councils) not to make 'unnecessary use' of a 20 mile stretch of local beach. This serious discharge incident was both a very tangible aberration in local community activities (eg interrupting recreational activity) and also vivid signification of the existence of operating difficulties at BNF, Sellafield. It was a possible catalyst for the revision, reconsideration or reconditioning of local views, in the context of the scientific dispute which the YTV programme had initiated. From the perspective of our own research interest, linguistic analysis of responses to the beach contamination incident are deeply revealing about local attitudes to the 'risks' from Sellafield.

#### 2.5 Local perceptions of 'risk'

Crucial to our analysis of the relevance of Black to local communities is knowledge about the complexion of local attitudes about these disputed risks. Before eliciting people's attitude to the Black Report, the survey questionnaire sought to understand in very general terms whether or not people were concerned about health risks suggested to be attributable to Sellafield.

They were asked separately about concern (or lack of it) about personal risks, risks to other adults and risks to children. Three key categories of response (apart from 'cannot say' and 'try not to think about it') could be recorded on the questionnaire, vis., not worried; concerned; anxious. Provisionally we interpret these terms in the following way:

Not worried: there are reasons to dismiss allegations of radiation induced health risks in the local area.

Concerned: either: I have considered and worried about radiation-induced health risks in a general way.

or: I am concerned that there should be no radiation-induced health risks; I am subject to a climate of doubt about levels of radiation and the effects of radiation. (This interpretation does not assume, as the first one does, that levels are too high - it is more an expression of confusion.)

Anxious: worried - to the extent that it has affected activities, plans, and/or mental well being; (but even this response does not necessarily imply a belief that ionizing radiation causes a tangibly increased risk of illness in the local area - once more it might denote a more extreme form of confusion or uncertainty\*).

The distribution of responses is given in Table 1. Concern and anxiety is obviously greatest for perceived risks to children (the YTV programme highlighted leukaemia in children), though all the figures are highly significant - there is a high proportion (nearly 45%) who reject or dispute any concern. For perception of personal and adult risk, the majority state that they are 'not worried' but significant numbers of people suggest concern and anxiety.

A subsequent question, asking in more detail about particular means of exposure to radiation levels (five categories mentioned in the Black Report), elicited the responses given in Table 2.

\*NOTE: This distinction is informative to the rest of the analysis set out here; the opposite of a 'no risk' response is not necessarily a 'high risk' response but more likely a response of confusion and uncertainty. What has changed for a lay respondent is not the technical grounds by which these statements are made but his or her interpretation of the institutional quasi-scientific (since the public is not technically illiterate) context in which competing claims about risk were being made. Any understanding of risks by a lay public is complexly mediated through channels of information and relations of authority and power.

TABLE 1    How respondents describe their feelings about radiation induced health risks in the context of radiation levels as a result of B.N.F.'s operations at Sellafield

	Not worried	Concerned	Anxious	Cannot say	Try not to think about it
Personal risk	67.0%	21.9%	4.3%	2.2%	4.6%
Risk to other adults	63.8%	24.1%	5.2%	3.3%	3.7%
Risk to children	44.7%	39.5%	11.5%	2.6%	1.7%

TABLE 2    How respondents feel about radiation levels for each of the following

	Not worried	Concerned	Anxious	Cannot say	Try not to think about it
On the beaches	44.7%	39.3%	11.5%	3.0%	1.5%
In house dust	75.3%	8.9%	3.3%	11.3%	1.3%
In the air	68.5%	15.8%	3.7%	10.8%	1.1%
In fish and other sea food	59.7%	25.8%	7.8%	5.2%	1.5%
In milk	71.4%	13.9%	4.6%	8.4%	1.7%

Beach radiation levels would be expected to be very prominent in the public consciousness following the serious discharge and subsequent beach contamination incident in November 1983.

The issue of plutonium in housedust had been raised in the Yorkshire Television programme in November 1983, with an emotional interview with a local householder and subsequent press coverage. The issue was explicitly mentioned by a few respondents in the survey who had sent housedust samples to be monitored by a university research team. It was not generally seen as an issue to be concerned about in the survey sample as a whole (and a number of people expressed an ambivalence about whether or not they should be concerned). The same was true of radiation levels in the air - much less of an issue than the beaches, and an issue for which there was apparently much less local knowledge. Radiation concentration in fish and other seafood was a more widely recognised source of concern: possibly because the pathway of contamination (ingestion) is more obvious.

Concern and anxiety (30%) is much higher than for dust, air and milk, and in addition, a significant number of people gave the response 'not worried' because they no longer eat fish anyway. The latter interpretation is certainly more in keeping with evidence for a substantial fall in local fish sales. The issue of possible radiation contamination of milk is again not a prominent local issue. The pouring away of large quantities of possibly contaminated milk which occurred after the Windscale fire of 1957 has left a legacy in local consciousness, although it is cited as an instance of the responsibility of the UKAEA organisational 'might' in the face of proven hazards.

The above data are presented less as social statistics truly 'representative' of feeling in the locale than as broad signposts to the attitudes of the people for whom the significance of the Black Report is assessed below. In as much as 'concern' can be categorised in the above terms, what is very apparent is the wide distribution of opinion; it is impossible to dismiss concerns as pertaining to an insignificant minority; neither should the area be portrayed as one of endemic fear - significant numbers of people reject any

basis for concern. A more detailed analysis and evaluation of questionnaire findings summarised above is given in Berkhout and Macgill (1985). Appendix B to the present paper contains a summary of responses to the additional survey question 'Do you think there is a cancer excess in this part of West Cumbria?'. See also Table 3.

It was the controversial Yorkshire Television programme "Windscale: the nuclear laundry", broadcast on 2nd November 1983, which caused the Black Inquiry to be convened. The West Cumbrian viewing figure of 80% - either at the time of the original broadcast, or subsequently on video, bears witness to the significance of this programme for local people, drawing them into the controversy. (Views on this programme are summarised in Appendix C.)

#### 2.6 Local contact with the Black Report

The means by which people acknowledged they had come into contact with the Black Report are given in Table 4. Television was the most frequently mentioned source of information, acknowledged by about three-quarters of the sample (74%). The next most popular sources were the local press and the national press, with about half of the sample acknowledging these. About one quarter of respondents acknowledged each of the next three sources: many people had read or scanned leaflets containing summary information about the Black Report, which had been circulated at work or to households. As many as one quarter of the sample suggested they had read the Black Report. A similar proportion acknowledged it as a topic which had arisen in their own conversations. We would draw attention to this as a relatively low percentage figure, indicating that Black was somewhat removed from ordinary people and from the very evident presence of Sellafield in everyday experience and discourse. Only 7% of those interviewed had attended public meetings on the subject. Less than 10 people

specifically mentioned radio as an information source, but this low figure must be more due to an oversight in the questionnaire design (the omission of radio as an explicitly mentioned source) than to the absence of radio's function as a source of information (and there have certainly been a considerable number of radio broadcasts on the subject).

People's views on the reasons why the Black Report was commissioned are reviewed in Appendix D.

TABLE 3    Responses to the question 'Do you think there is an excess of cancer in this part of West Cumbria?'

	Yes	No	Don't know
% responses	33%	36%	30%

TABLE 4    Responses to the question 'How did you hear or read about the Black Report?'

	Tele- vision	Local press	National press	Circulated leaflet	Word of mouth	The Black Report itself	Public meetings
Frequency of response	336	234	225	129	112	119	30
%	74	51	49	28	25	26	7

### 3. Local reaction to the findings and presentation of Black

#### 3.1 The empirical basis

The empirical basis for assessing local reaction to the findings and presentation of the Black Report (and hence of the local significance of the Black Report in these terms), is through a single open question inviting people to express their views in their own words - one of a number of open questions on the survey questionnaire. Reflection of the significance of related factors and events to the local population (and in turn, evidence of the need to allow respondents freedom to express themselves in their own words, without being unduly constrained by pre-imposed question format) lies in the complexity and extensiveness of responses to the survey's questions. And for other questions on the survey, responses were much more extensive than for the question on the Black Report.

The responses given to the question 'What did you think of the presentation and the findings of the Black Report?' were recorded on the questionnaire and have been coded below according to our preconceptions (partly intuitive, partly informed by our prior knowledge or awareness of characteristics, general and particular, about the Black Report, the nuclear industry in West Cumbria, media reportage, government reaction, environmental politics and so on) of what would constitute sensible discrimination of one type of comment from another. Other analysts may well have different notions in this respect and therefore produce a different analysis; all we can do is project an interpretation we consider most realistically portrays the sentiments and attitudes being expressed by those who participated in responding to the survey.

As has been suggested, the categories by which 'public opinion' is to be represented and analysed below flow out of public discourse itself - public discourse which has been disrupted and intervened upon by the questions chosen for inclusion in the questionnaire - but public discourse nevertheless (cf the use of closed, pre-formatted questions in much risk attitude questionnaire work). The frameworks of discrimination used below in analysing the responses may appear to be somewhat different from the technicalist,



externally-imposed classifications used elsewhere in risk perception research. What we have tried to do is retrieve 'public opinion' from the grasp of the 'analyst's (and often industry's) own technical frameworks of assessment and place it back in the hands (or words) of the public themselves.

A selection of complete responses to the key question 'What did you think of the presentation and of the findings of the Black Report' are given in Appendix E. Below the full set of comments<sup>is</sup> analysed at two 'levels'. First, a detailed compilation of the different types of statement that were made in response to the question. Second, a coarser aggregation of these statements, into categories of topic, enabling associations of types of comment with biographical characteristics of the respondent and with patterns of concern (cf Tables 1 and 2) to be examined.

### 3.2 The detailed schedule of responses

#### 3.2.1 The methodology of compilation

The finest level of resolution which we chose to adopt led to the discrimination of the 66 different types of statement that are given in Table 5. The responses of almost everyone who answered this question consisted of several of these remarks, so the processing of the full responses in the compilation of this Table, whereby full responses have been dissected into a series of constituent phrases (semantic units), represents a degree of disruption of the actual utterances; and different parts of what was originally a single response now appears in different parts of the Table. (The numerals in the far left-hand columns of the Table record the frequency of occurrence of each remark over the complete set of responses, and their frequency in terms of coming either as first, second, third, fourth, fifth, sixth or seventh phrases in each complete response).

We suggest that the phrases discriminated in Table 5 represent the basic conceptual raw materials with which West Cumbrian people have thought about, talked about and interpreted the Black Report. Some phrases are exclusive to one another (for example 15 and 50) but others are not (39 and 41): some may have been said together in the same conversation whereas - for the sake of consistency - other pairs could not.

Freq. by position in response								Overall freq.	Statement description	
1	6	1	2	-	-	-	-	9	General evaluation	A Very good report/Very well done
2	1	1	4	-	-	-	-	6		A I agree with the report's findings
3	10	2	4	-	1	-	-	17		A Satisfied/Happy with report/Findings/Report was helpful
4	14	6	7	-	-	-	-	27	Specific evaluation	B Accurate/Detailed/Scientific report
5	14	13	5	1	-	-	-	33		B Fair/Unbiased/Genuine report
6	3	6	-	4	1	-	-	14		B Conclusive report/Sellafield is not the cause of cancer
7	-	1	-	-	-	3	-	4	Effect	C People should look at other causes
8	-	-	1	2	1	2	1	7		C Made me aware we need to know the causes of cancer in this area
9	12	7	8	4	3	-	1	39		D It set my mind at rest/Reassuring
10	3	5	2	1	3	1	-	15	Presentation	D Reassuring for the community
11	4	-	1	-	-	-	-	5		I'm confident in Douglas Black
12	49	6	1	-	-	-	-	56		E Well presented/Pretty good presentation
13	2	8	1	-	-	-	-	11	General evaluation	E Easily understandable/Well written too
14	-	-	1	-	3	-	-	4		Pleased with the recommendations
15	21	13	4	2	1	-	-	41		*W Acceptable findings/Adequate report/Mildly reassuring/Sensible
16	4	9	10	6	-	-	-	29	Specific evaluation	F They did the best they could with time and resources they had/
17	13	26	10	3	2	-	-	54		F Can't determine the cause of cancer so quickly
18	6	4	1	-	-	-	-	11		F All I expected/Much as I expected/Predictable/Not surprised
19	2	1	-	-	1	-	-	4	Effect	He knows more than me/You have to believe the experts
20	4	4	1	-	1	-	-	10		Happy that something is being done/And that we're being told
21	-	-	-	-	-	2	-	2		It gave evidence of high incidence of child leukaemia
22	-	-	-	1	-	-	-	1	Specific evaluation	G The numbers were too small to come to a conclusion
23	1	3	-	-	-	1	-	5		G The public can't understand the concept of uncertainty in science
24	2	1	3	-	2	-	-	7		F It was done in a hurry/There wasn't enough time
25	3	3	-	1	-	-	-	7	General evaluation	G No-one knows everything/There was a lack of evidence
26	1	1	1	1	-	-	-	4		G You can't prove a negative - that it isn't caused by Sellafield
27	-	-	-	2	-	-	-	2		Report showed there's no more risk living here than anywhere else/
28	1	1	8	1	-	-	-	11	Effect	All comparative risk arguments
29	1	1	-	1	-	-	-	3		*B I was happy that no connection was made with the factory
30	3	-	3	2	-	-	-	7		H Report attracted a lot of controversy
31	-	2	-	1	-	-	-	3	Presentation	H Report was trying to please everybody
32	-	-	1	-	-	-	-	1		H Report interpreted differently by different people/groups
33	3	-	3	-	-	-	-	5		H The media treated the report badly/In an anti-way
34	9	3	-	-	-	-	-	12	General evaluation	Report hasn't made any difference to local attitudes
35	11	3	1	-	-	-	-	15		Report was presented all right/They seemed capable people
36	2	1	4	-	-	-	-	6		J Report could have been put over better/Boring report
37	-	4	3	1	-	1	-	8	Specific evaluation	J Not a very clever presentation/I was not confident about the presentation/Poor presentation
38	6	16	19	14	10	4	1	70		J A shortened version would have been useful for the man-in-the-street
39	23	26	12	9	3	1	-	74		Black was trying to reassure the public (rather than find the truth)
40	3	4	1	1	-	2	-	11	General evaluation	*T Open for more research/More research needed/This is only beginning
41	10	11	5	4	3	-	1	34		K Inconclusive/Not Definite/Inadequate/Left a doubt
42	7	2	2	-	-	-	-	11		K Vague report/Woolly
43	2	5	-	6	1	-	1	18	Claim of ignorance	*V Confusing/Didn't come out one way or the other/Said so little/Ambiguous
44	47	3	2	-	-	-	-	52		*V Rather thick/Too long/Drawn out/Heavy going
45	22	3	1	-	-	-	-	26		M It didn't find anything new/Didn't tell us anything new/It didn't prove anything
46	8	1	-	-	-	-	-	9	General evaluation	L I didn't think anything about it/I don't know/I've forgotten
47	57	3	-	2	-	-	-	62		L I can't say/Can't comment
48	2	-	-	-	1	-	-	3		L Didn't hear about the findings
49	3	2	5	1	-	-	-	11	Specific evaluation	L Not interested in the findings
50	7	11	4	-	2	1	-	25		N Report was a hedge/I'm suspicious of the report
51	-	-	-	-	-	1	-	1		N I wanted to believe the report but couldn't/Unreassuring
52	1	1	1	-	-	-	-	3	Presentation	N Disappointed/Not impressed/Unconvincing
53	-	1	1	-	-	-	-	2		N Unconvincing for the general public
54	18	14	4	5	-	-	-	41		Mixed feelings
55	2	3	-	1	-	-	-	6	General comment	P Figures can be manipulated to say what you want them to
56	1	3	4	-	-	-	-	9		*V I couldn't understand the report/Too technical for the layman
57	4	5	2	1	-	-	-	12		Q Biased towards BNFL/Report too cautious
58	-	2	1	1	-	-	-	4	Criticism	P Incomprehensible/Limited/Unscientific
59	1	1	-	1	-	1	-	4		M Didn't get to the bottom of it/Not in enough depth/Didn't tell enough
60	6	5	3	-	1	-	-	15		Q Disclosure couldn't be too risky/Politically worded report
61	2	-	1	-	-	-	-	3	General comment	Q He said what they wanted him to say/I think he'd been bought
62	1	3	4	2	1	-	-	11		R Not happy with the report/Whitewash/Cover up
63	6	2	-	1	-	-	-	9		*R Things are still being covered up in the interests of BNFL
64	3	4	1	-	-	-	-	8	Criticism	M It didn't help anyone by being undecided
65	1	1	-	1	-	-	-	3		R I wasn't happy with Douglas Black/He didn't seem to be able to put things very well
66	6	4	1	1	-	-	-	12		S Alarming report/Upsetting/Proved we were at risk
										S Contradictory report/Conclusions incompatible with the data
										Waste of money/Useless exercise/Load of rubbish

Since, as we have noted, they appear in Table 5 in a completely de-contextualised state, torn from their 'subjective' places in actual conversations, when we comment upon them below - in effect, measuring them against other fragments from other conversations - we are to some extent bringing a new meaning or significance to them. We are assessing them as generalised, socially produced and reproduced arguments and propositions, not as particular phrases, embedded in and deriving meaning out of a conversation or speech act.

At all stages of the collation process the categories which were extracted and abstracted from phrases were produced in terms of the phrases themselves. Phrases were compared for their substantive meaning with other phrases. In many cases there may be cause for disagreement over the inclusion of a phrase in a given category and, the further meanings are (into topics for instance) generalised/ the more contentious become these categories. An illustration of coding difficulties can be given in the context of statement category 34. Grouping the phrases/units Inconclusive/Not definite/Inadequate/Left a doubt, brings another level of new meaning to them - a meaning which is in relation to the other word-phrases in that category. In this example it is perhaps 'Inadequate' which sticks out as having a significantly different meaning than the others. It could be argued in defence of the classification however, that the charge 'Inconclusive' implicitly denotes a fundamental criticism of the report, (the reason for having a report being to provide some conclusions, some solutions), much the same as 'Inadequate'. The grouping of the terms 'Inconclusive' and 'Inadequate', then, throws them both into relief in a prior stage of analysis, and the meaning of the category as a whole is thereby also broadened and enriched (the linkages, resonances, and contrasts latent in the discourse are partially revealed in the very process of categorisation).

Problems and paradoxes are unavoidable in the process of categorisation of a huge number of semantic units. If we constructed categories purely out of synonyms or metonyms (and

who could regulate that? - there are no conventions for measuring meaning in that very subtle sense) not only would the coding list be unmanageably long, but the tensions of meaning and interpretations made possible by grouping together similar types of comment would be entirely absent: the flow of argument, the various devices of meaning; irony, logic, humour, would be missing from our analysis. By creating the categories given in Table 5 we are acknowledging that there may be a range of meanings attached to any single utterance, a range of meanings which we can synthesise by grouping one with other similar utterances which have actually (in this case) been made by other people. Not only are we admitting a certain freedom of meaning to penetrate our analysis but we are also allowing into it the semiotic movement of interpretation which we deem to be a primal feature of speaking, and listening to, language. We are harnessing the infinite chain of signification to our own particular interpretative task (Macgill and Berkhout, 1985).

There can be nothing fixed or static about the interpretation given below of responses to the particular question on the Black Report, and there will doubtless be objections raised about the way we have reconstructed some elements of the local discourse. All that can be said in defence of the analysis below is that we have attempted to keep the interpretation as non-controversial as possible in the light of personal experience of local conditions, familiarity with the configuration of the main arguments around the events covered in questioning, and a concern to remain as faithful to the intentions of the local people we interviewed as possible.

### 3.2.2 Analysis of statements

In order to concentrate on the most often repeated remarks, all statements from Table 5 with an overall frequency greater than 20 have been abstracted into Table 6, and ranked according to their overall frequency. The frequency with which each statement appeared as first, second, third, fourth or fifth phrase in individual responses is seen more clearly in Table 7.

The following three categories of comment emerge: broadly favourable, broadly uncertain and broadly unfavourable. These are evaluated in turn.



TABLE 7 Ranked frequencies by order of statement within total responses

<u>STATEMENT 1</u>		MISSING 10
<u>CODE</u>	<u>FREQ.</u>	
47	57	Not interested in the findings
12	49	Well presented/Good presentation
44	47	I didn't think anything about it
39	23	Inconclusive/Not definite/Inadequate
45	22	Can't say/Can't comment
15	21	Acceptable findings/Adequate report/Sensibly/Mildly reassuring
54	18	Can't understand the report/Too technical for the layman
4	14)	Accurate/Detailed/Scientific
5	14)	
		Fair/Unbiased/Genuine
17	13	All I expected/As much as could be expected
<u>STATEMENT 2</u>		MISSING 193
17	26	All I expected/As much as could be expected
39	26	Inconclusive/Not definite/Inadequate
38	16	Open for more research/More research needed
54	14	Can't understand the report
15	13)	Acceptable findings/Adequate/Sensible
5	13)	
		Fair/Unbiased/Genuine
50	11)	Disappointed/Not impressed/Unconvincing
41	11)	
		Confusing/Didn't come out one way or the other
<u>STATEMENT 3</u>		MISSING 306
38	19	Open for more research
39	10	Inconclusive/Not definite/Inadequate
16	10	They did the best they could with the time and resources/ Can't determine cause of cancer so quickly
17	10	All I expected
9	8	It set my mind at rest
<u>STATEMENT 4</u>		MISSING 373
30	14	More research
39	9	Inconclusive
9	8	Set my mind at rest
<u>STATEMENT 5</u>		
38	10	Open for more research

# BROADLY FAVOURABLE STATEMENTS (/)

The first positive remark is ranked 4 'Well presented': a direct and very simple response to the first component of the question that we put (presentation). It can be seen from the score profile (Table 6) to have been almost a throw-away remark. If it was said, it was generally the first thing said (see also Figure 1); a remark made while the respondent considered the complexity of the question\*. Presentation (the document itself, the rituals of publicity and dissemination, the personalities associated with the report etc.) is about its overall authoritativeness or legitimacy and 'science as public policy' (Macgill, Ravetz and Funtowicz, 1985). 'Presentation' has nothing specifically to do with the substantive findings or recommendations of the report but rather either (a) with the competence of its officialdom - commissioned by the government, headed by a distinguished scientist, given a lot of publicity locally and nationally, unveiled officially and commented on by a range of 'important'/'interested' organisations and individuals. These respondents, then, were aware that the paraphernalia of expert investigation had been correctly applied, that the structured 'image' of the report had been competently produced, that the Black Report had performed in the right way, and had proved its own legitimacy. In this way, then, comment about presentation might be used to signify a wide range of important but perhaps inexpressible cognitions and perceptions of Black, or (less likely), (b) the report was made easily accessible to the putative audience (who were they?) - in this case the local public. We take this to be a narrower interpretation of the term presentation, and generally not one corresponding with the question answered by respondents. The 'presentation' in this sense of dissemination of the results was carried out mainly by news media, and therefore happened beyond the Black Report and its authors.

The first positive comment about the content of the report is ranked (7). Fairly non-committal, favourable but slight disinterested general remark about the report and its findings conveys a sense

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\*Later analysis will show how often it occurred by itself and how often with other statements of various kinds.

that the investigation and report were soberly and uncontroversially conducted and written but that in reality the fact of its being done or its conclusions little affected local and national debates - it was 'mildly reassuring' and 'sensible'. A fairly distant government report, spoken about in generalities, relevant to (more specialised) argument going on elsewhere.

Ranked (9) is the first unqualified favourable statement, proof that the report had achieved what Black had stated initially, were its aims - to reassure local opinion. For these respondents not only had the report been prepared in the proper manner but the results and recommendations had assuaged any doubts which they may have held after November 1983. The report had actually changed their minds, or perhaps more accurately, confirmed to them that there was no reason to be uncertain about local health issues.

Ranked (11) and (13) are similar statements concerning the fairness (the Justice) and accuracy (the Science) of the report. Obviously any document of this type must be assessed according to these criteria, but in this case the significance of these statements is that they were usually uttered in the form of a refutation of the unfairness and bad science of the YTV programme. The Black Report was 'unbiased' and 'scientific' as opposed to the YTV programme which was 'biased' and 'unscientific'. Often these two qualities were conflated. Much of the allegation of unscientificity of the YTV programme rested on its manipulation of statistics, or the 'bias' in its science. The Black Report here, represents a return to impartial reason, a reimposition of scientific order to an issue distorted by prejudiced interests.

The last is just a stronger re-statement of statement (15) ranked (2) in favourable responses. Favourable responses to the Black Report (as they were detected by our questionnaire and



organised at this level of interpretation) therefore fell into four dominant groups, given below in the order of their occurrence:

- (1) The report had a good image.
- (2) It was a credible government report somewhat removed from public interest.
- (3) It was reassuring.
- (4) It was fair and accurate (as opposed to the YTV programme).

#### BROADLY UNCERTAIN STATEMENTS (?)

The two most frequently given types of statement ranked (1) and (2) are closely related. Both are directly concerned with the substantive content and conclusions of the report (i.e. different from statement (12)) and both imply that Black failed to achieve the reassurance he was seeking.

(39) is probably particularly aimed at the 'Qualified reassurance' phrase in the report. It is a comment which does not accept the nature of that 'qualification' (small number problem) but sees it still with suspicion. Nothing therefore has changed with the Black Report, and the only solutions which have been suggested are that (38) more research work needs to be done into the problem. Local opinion remains in a state of suspension and doubt while this work is completed. The time frame of this further research is unknown. This corresponds closely with recommendations of Black but the view refuses to accept as adequate Black's 'reassurance'.

Ranked (6) is the fairly disparaging remark that 'It was all I expected'. Either

(a) 'I had no expectations of it providing any new evidence or of suggesting new solutions - this has been borne out', or,

(b) 'I knew there was no risk and the Black Report has made no difference to my opinion, or,

(c) I felt there was no risk but the Black Report has predictably not come up with anything new so I'm no clearer now than before.

(d) It lived up to all the hopes that I had invested in it, it provided all the information, reassurance and recommendations that could have been wanted. From local experience, in undertaking the survey, this is not the dominant intended meaning.

Ranked (10) is a statement linked to the statement ranked (1) except in this case the charge is somewhat more serious. The report was confusing and ambiguous as well as inconclusive. It was difficult to understand, and had perhaps been deliberately fudged (ambiguity is often intended not simply read), little of it could be understood. The respondent was just left confused/baffled by the report and unhappy by the apparent lack of a conclusion. As a public, authoritative statement of the facts the Black Report had failed - nothing could be gained from it but uncertainty.

From Figure 2 it is striking that the three top ranked 'broadly uncertain' statements increase in frequency within people's overall responses, i.e. they are predominantly the second or the third thing that people have said. Statement (38) (further research) increases to a maximum at statement (3) and after that remains by far the most frequent response, i.e. for longer (deeper) responses, this was an especially common remark to include. Similarly, though perhaps less markedly, statements (39) and (17) ('inconclusive' and 'all I expected', respectively) are predominantly second comments; doubts and hopes are embedded within commentary and qualification.

Ranked (12) is a set of statements closely similar to statement (1), that is, 'The Black committee did the best they could in the time available'. Cancer research, of which this is but another example, works within large time frames, the causes of cancer generally are unknown (popularised by 'You can't find the cause of cancer in six months'). It is therefore unreasonable that the answers to these old and fundamental questions be found in an eight month investigation. Within the obvious limits of present knowledge the report was intensive and comprehensive enough but it was doomed from the start (similar to 'all I expected').

This is typically a local argument, ignores the fact that leukaemia might be a special case, but follows directly a 'common-sense' understanding of cancer research.

The group of opinions we have designated 'Uncertain' can therefore be characterised as consisting of:

(1) The Black Report was inconclusive.

(2) More research is required to clarify remaining ambiguities in the evidence.

(3) The Report contained no more or less than I expected, it did not prove to be the advance other people might have been hoping for.

(4) The Report was confusing as well as inconclusive.

(5) The Black Report was one more (well-conducted) stage in the long tradition of cancer research which typically advances in small steps.

#### BROADLY UNFAVOURABLE STATEMENTS (X)

Ranked (8) is a criticism of the presentation of the technical evidence in the report. Either these respondents had tried to read the document or this was a reason for not having done so. The comment deals specifically with the report itself and not the dissemination of its contents via the media, that is, these respondents recognised that in this debate it was important to seek reassurance through a primary source. The primary source however was not accessible to this potential readership and in this way the report served as yet another means of exclusion from a scientific debate, for a public who could readily see the significance of that debate to their own well-being. i.e. The report extended the climate of confusion because it did not allow people to make up their own minds. This need to engage in the process of scientific reasoning set out in the report can be seen as symptomatic of a second, deeper principle of fairness running through evaluations of the report (the first being fair science); the need for accessible scientific language and logic which is freely available outside the restrictive terms of any particular issue and on which it is possible to make major decisions (like moving house) rationally. The Black Report was therefore received at two distinct levels. The first was satisfied that in the context of the dispute the inquiry

had concretely proved its scientific authority, the second wished to interrogate the scientific method of the report and in doing so implicitly brought attention to the relations of authority and expertise on which it was based\*.

Ranked (15) is a very generalised comment about disappointment/incredulity at the report. That is, criticism of the way the investigation was conducted and of the adequacy of the report which was written, disappointment that the report was not able to produce firmer conclusions, and incredulity of the way the statistical evidence available had been interpreted by Black. All these remarks are inter-related and represent a different perspective on issues and problems that we have already touched upon above. This is not to suggest that there are 'scales' of opinion necessarily, because any comment necessarily sits within a whole framework of private discourse, but that similar central problems are being addressed using different linguistic resources.

Statements designated 'Unfavourable' are therefore broadly classified under two headings:

(1) The Black Report itself was too difficult to understand for an interested lay-public.

(2) It did not measure up to the requirements of credibility and thoroughness expected of it.

Finally, ranked (3), (5) and (14) are a range of comments claiming ignorance or disinterest in the report. These comments appear

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\*This formulation, based as it is on the empirical basis of real speech follows very closely Habermas' discourse theory of truth.<sup>1</sup> This contains three basic concepts:

"...: conditions of validity (which are fulfilled when an utterance holds good), validity-claims (which speakers raise with their utterances, for their validity), and redemption of a validity-claim (in the framework of a discourse which is sufficiently close to the conditions of an ideal speech situation for the consensus aimed at by the participants to be brought about solely through the force of the better argument, and in this sense to be 'rationally motivated')"<sup>2</sup>

<sup>1</sup> Moralbewusstsein und Kommunikatives Handeln, Frankfurt, 1983.

<sup>2</sup> Jürgen Habermas, 'A Philosophico-Political Profile' in NLR, Vol. 151, May/June 1985.

almost exclusively as 'first' comments (i.e. generally the only comment). For these respondents who form the vast majority the Black Report clearly means little or nothing at all.

### 3.2.3 Preliminary evaluation

In this preliminary analysis we have chosen to isolate three groups of statements<sup>\*</sup> which seem at this level of semantic categorisation to be more or less distinct in meaning. Also a fourth which has nothing whatsoever to say about it.

In the top six ranked statements, three suggest uncertainty or doubt about the conclusions of the report and worth of the whole project (in providing reassurance), two claim to have no interest or recall of the Black Report and one is a throw-away remark about the 'image' of the report. Of the 461 people interviewed only 38 said that they had been 'reassured' by the report. We would suggest that on the basis of these findings the Black Report has not achieved very adequately what it set out to do, that it has been received with a mixture of disinterest and confusion, and that its main purpose, retrospectively, was to have begun an as yet unfinished series of investigations into child leukaemia in West Cumbria.

That summary would, however, only be based on about 39% of the total statements (1,007) made in response to this question. Ranked (7), (9), (11) and (13) are a range of favourable statements regarding the nature of the conclusions of the report, and the way in which they were derived. Clearly alongside the more visible apathy and disquiet over the report there are others who affirm it as a legitimate, competent work of science, and by doing so, to contrast it with the YTV programme. That the problems highlighted by that programme are widely recognised to remain is not so much at issue, but at least the perceived excesses of 'Nuclear laundry' have been avenged. The level of overt criticism of the report is rather muted and rests particularly on its difficult, sophisticated style which has excluded a lay-public which is deeply interested and concerned with the issue.

\* broadly favourable, broadly unfavourable, broadly uncertain.

At this stage it is worth reemphasising that these general conclusions are heavily dependent on the particular research procedure adopted, the questions asked, classifications made and so on. Partly what the analysis tests is the performance of the questionnaire in the context of local discourse, although this performance could never be 'objectively' measured. Also it cuts across the flow of argument and meaning internal to a speech act which elsewhere we have emphasised, and will later analyse. We have limited the above discussion to some brief comments on the stronger tendencies revealed in Tables 5-7 and Figure 2.

### 3.3 An aggregated analysis

#### 3.3.1 The aggregation of statements into topics: methodology

In order to reach a comprehensivity and level of generality not possible with 66 coded statements and a level of classification that is manageable for broad statistical, clustering and topographical analysis, statements were aggregated into broader topics for a second level of analysis\*. The statement schedule (66 statements) then, was reduced to a topic schedule (21 topics, see Table 8). This reduction was strictly concerned with grouping together similar statements, thereby substantially simplifying the table of statements while making possible an extension and deepening of the interpretation process begun in the first level of analyses. The classification is one which leaves open the possibility of integrating topics and the issues they raise, thus hopefully keeping the analysis live, not closed, shrivelled and dry. In creating this sketch map of local discourse about the Black Report there are some overlaps with the analysis of statements in the previous section. These have been allowed to remain because they are illustrative of the process and techniques of interpretation and because they highlight the particular problems of that interpretation. If aggregations at different levels tell different stories then that has implications both for the interpretation used and the broader concepts which are being employed in analysing the data.

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\*Gr. ta topika, the general principles of argument, Chambers Twentieth Century Dictionary.

TABLE 8    Abbreviated topic headings (alphabetical coding consistent with that in Table 5)

- A.    Commendation of Report and findings in general terms.
- B.    More explicit commendation of the Report's science and conclusiveness.
- C.    Observations of the need for research into other causes.
- D.    Report reassuring to respondent/community.
- E.    Commendation of presentation.
- F.    Black limited by available time in which to Report/All I expected.
- G.    Observations about uncertainties in the Report's science.
- H.    Hedged comment about the style of the Report.
- J.    Criticism of the presentation.
- K.    General criticism of the content - vague, inconclusive and confusing.
- L.    No comment/not interest/no knowledge.
- M.    Observations that the Report didn't get anywhere.
- N.    General criticisms of Report's credentials and conclusions.
- P.    Specific criticisms of Report's science and statistics.
- Q.    Critical of the underlying drift of the Report.
- R.    Critical of Black's deliberate misinformation.
- S.    Other comments connected by a basically critical attitude.
- T.    More research is needed.
- V.    The Report was difficult to understand for the language.
- W.    Report as adequate/acceptable (though of little interest).
- X.    Other statements - not coded as topics.

An attempt to be comprehensive about discourse analysis by disaggregating responses, as we have done, has to answer the problem that some people or groups of people (particularly those with extreme positions) talk more and therefore will tend to distort the sample of topics. We would contend that in the practice of 'opinion leading' these more voluble groups have a disproportionate effect anyway, they are the one's who set the agenda for the debate; the 'objective' communicative sphere is dominated by them, there is no democracy or equal rights of participation in public debates (even though questionnaires usually pretend that there is). Any analysis of a local discourse should accommodate this.

Two further principles guided the process by which the topic list was constructed from the statement list, in addition to the basic goal of discerning similarity in an adequately open fashion.

(a) Statements of a similar level of specificity/generality were grouped together, i.e. 'Acceptable findings/Adequate report' was classified as different from statements such as 'You can't prove a negative' or 'There was a lack of evidence/No one knows everything'.

(b) Key phrases or arguments which appeared in previously distinct statements were grouped together, e.g. 'People should look at other causes' and 'Made me aware we need to know other causes of cancer in the area' would be grouped.

For some topics groupings may not seem immediately clear, but their discrimination was informed, as before, by our pre-conceptions of what were significant characteristics of this context in West Cumbria, and the theoretical literature on risk, technology, expertise, professionalism etc. The range of meanings for each category is not equivalent. Some are more complex and ambiguous and therefore appear to have a wider span of meaning.

Not all statements have been aggregated into topics; remarks uttered with low frequencies are omitted from the 'topics' analysis because at this stage we are concerned with a comprehensive overview of core arguments and ideas. We are not completely ignoring the more original statements (see Table 5); they will, though, be peripheral to the broad statistical analysis



given below. We will also be presenting listings and interpretations of selected quotations from responses in a further separate analysis. These will often throw into relief, and therefore aid the interpretation, of core concepts because they are often simply more extensive, imaginative expositions of these same discursal elements.

It is important to notice that the ranking which has been given to the statements throughout the above is purely notional - it does not necessarily correspond to a ranking of opinions. We hold that such ranking, in terms of the surface semantics of a statement is not possible, it soon becomes clear that serious problems arise when ranking meanings. Meanings are not always clear, singular and unitary, and besides there are many cross-linkages between categories which could never be satisfied in a singular unilinear ranking scale.

Perception, understanding, interpretation, value and so on are all multiple, connected processes, that is they all imply a temporal component and therefore the potential for change. Speech acts which are monitored in the course of doing the survey invariably touched on a number of very different facets of interest or involvement which the respondent had in the issue problem being discussed. Often these would arise in unexpected ways; connections being made in original ways, or unresolved paradoxes appearing - to represent this diversity and complexity at the level of individual speech acts as merely 'rankable' opinions would be erroneous.

In the following paragraphs we describe more fully what we understand to be the meanings contained in each of the 21 topics summarised in Table 8, and elaborate on their additional significance. (Some of our interpretations here are coloured by what we knew about further cross tabulations - reported in a later section below - between the topics given in Table 8 and the response patterns summarised in Tables 1 and 2.)

Topic A.\* This is a commendation of the Report and its findings in general terms and an expression of agreement with its conclusion. It is not necessarily an agreement based on the data and scientific method of the Report but an agreement based on opinions already held. The Report in other words could be assimilated into a view which was generally unconcerned about radiation induced health risks from Sellafield and which might go so far as to reject explicitly the validity of the YTV allegations.

(The Report was taken up most eagerly by those who felt themselves to be in opposition to YTV and similar parties. Black has therefore become closely identified with Sellafield: apologists in the local discourse. The use of Black as evidence in this least specific, most unequivocal way is usually from the point of view of defending Sellafield's record and denying the cancer link that is its 'status').

Topic B. These are comments about the Report as good, comprehensive science. They might refer to the high quality of data used, the systematic method, the objective reasoning, and the search for truth. As well as those traditional descriptions of good science are further statements to the effect that the Report reached a fairly concrete conclusion - that Sellafield was not the cause of the cancers (cf. <sup>the wording actually used in the Black Report</sup> these calculations do not support the view that radiation released from Sellafield is the cause of the leukaemia'). Science, as practiced by 'genuine' responsible professionals then, had exonerated Sellafield.

(As with Topic A, this type of comment is not open to those who have doubts about RIHR.\*\* For people offering Comment B the science as it is presented in Black (though which has subsequently been a subject of much controversy) tends to prove the case against higher RIHR. Doubt about RIHR must therefore also include doubt in Black's science, and by implication doubt in the very science on which Sellafield is built. This is not an informed doubt but a larger fear not conversant in statistics, an unease without the comfort of having a logic or legitimacy.

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\* Of the 21 categories of 'topic' given here, many describe 'unfavourable' reactions. This in itself, though, is not a monitoring of 'opinion', for the categories merely constitute a scale of measurement (codes), and are not in themselves counts or frequencies of 'types' of opinion.

\*\* Radiation induced health risk .

- Topic C. These comments acknowledge that there is a local excess of leukaemia, that Sellafield is not the cause, and that there is a need for research into other possible causes (not a recommendation made by Black). New research effort has to be re-directed, away from radiobiological models towards other industrial (Marchon or Seascale effluent discharge pipe) or 'environmental' causes.
- Topic D. Comments to the effect that the Report was reassuring to the respondent and the community - any doubts which were held during the YTV programme controversy have been assuaged (partially or completely) by the Report. For these respondents the Report achieved what Black had set out to do. ('I have been taxed with reassuring the Cumbrian people; if this is a crime, I am happy to plead guilty to it' - Black, 1985).
- Topic E. Comments commending the good, clear presentation of evidence, argument and conclusions in the Report, by Black and other parties involved. This topic is discussed further elsewhere.
- Topic F. These comments recognise that the Black Advisory Committee was limited by the time available to prepare the Report. Comparisons might be drawn between this investigation of cancer rates with long-term horizons of cancer research in general. There is a popular apprehension that the origins and causes of other cancers are not known - medical science, bio-physiology, has not yet produced understanding, methods of prevention and cures. How can a six-month inquiry provide answers which are not yet available to medical science? These comments also emphasise the newness of the problem locally; November 1983 is the beginning of a research effort into specific cases of child leukaemia in Cumbria, which is a special case, i.e. cancer takes many forms, has many causes. Some people talked about the sewage outfall pipe on Seascale beaches as a cause - then the mysterious Seascale Bug.

These comments frame the problem in a particular way - as an open-ended field of research beset by the same problems, difficulties and uncertainties as all other cancer research. Cancer remains an enigmatic disease, whose aetiology is not properly understood, which takes an uncontrollable insidious hold of the body, and which is held in great awe by Western society.

Implicitly there is no reference made to (or rejecting) environmental ionizing radiation as a possible causes of this cancer - it simply remains an unknown, which is perhaps the common apprehension of cancer. Nor does it identify the evident need felt by Black to falsify the claim that radiation was not the cause by using scientific method. The result of which was to recast the uncertainty, in another direction, in effect perpetuating the myth of cancer, i.e. social and scientific ignorance is here used to defend science and technology. (There is an interesting paradox in these comments; on the one hand, the problematising of data or evidence in the field of cancer research and an acknowledgement that in view of science's confusion over cancer no real advance could be expected in this report alone. On the other, there is one known cause of leukaemia (ionizing radiation) and there is even a cure for it, so ignorance is not as deep as the comment suggests.)

Also grouped with Topic F remarks are the 'All I expected' comments. These could mean many things. 'It measured up to my expectations of scientific impartiality', or conversely, 'It was as limited and partial as the government wanted it to be', or more commonly, and this is the sense in which we have taken it: 'I didn't expect any revelations about the causes of leukaemia in this area, all Black could do was maintain that in the present state of knowledge there were no additional risks introduced into the environment by discharges from Sellafield. I believe that but it doesn't assuage the uncertainty'.

Topic G. These comments refer to problems of evidence, burden of proof and theorising in an ambiguous area of science, and how these problems (which have previously only been available to professional science) can be negotiated to a non-scientific lay public. The report was not only handicapped by the technical nature of its subject, but also by uncertainties contained in this technicality ('lack of evidence', 'you can't prove a negative'). The Black Report had the impossible task of resolving these competing demands of writing both a scientific account and a public account, of closing the gap between the public expectation of science (rational, comprehensive, powerful) and the science's own experience of advance (haphazard, acutely debated, uncertain). See also Macgill et.al. (1985).  
Points raised:

- 'lack of evidence' this has a connection with Topic F. but includes a more technical appreciation of the small number problem in statistics (see also Craft and Openshaw, 1985).
- 'you can't prove a negative' an impossibility argument which Sellafield has been set by the YTV allegations. An acceptance that protestations of 'not proven' will in the end be inadequate to calm lay fears. But it is also a position which may assume that Sellafield is not the cause and that its scientists should be spared having to prove that until better evidence to the contrary has been produced.
- Uncertainty in science (specifically uncertainty in epidemiology as it is portrayed and discussed in the Black Report) is not something which the lay public (who do not live in Cumbria) can understand or accept, particularly when associated with the nuclear industry. Nuclear physics and a successful negotiation of nuclear power to a lay public depends on a conception of a mature, theoretically sound and comprehensive pure science which is capable of producing awesomely powerful technology and of innovating technical solutions to any of its technical problems. Having an expert debate about incidences and causes of leukaemia in public can only cause further damage to the professional status of scientists and their technology because disagreement and uncertainty do not figure in this simple model.

Topic H. These are comments on the style of the Report and its reception by the media and interest groups. They remark of the Report being written 'so even-handedly that instead of bringing an end to the arguments it actually generated more argument. It could be used by every interest for its own purposes. It therefore fuelled suspicion, especially outside West Cumbria since Sellafield can no longer avoid controversy and public relations damage because of unfounded popular media hostility.

The blame for this must go partly to Black for (naively) believing that a full airing of all the differences of scientific opinion (the Report as dissent) would help towards public assurance. It tried to please everybody;

BNF, the government, Greenpeace and other critics, as well as the general public), was interpreted differently by the groups and therefore had a net disruptional effect, of the arguments and of public opinion. The 'media' is also partly to blame. Since it is mainly constituted by the reportage of controversy and conflict, so that it is the chief organ by which nuclear controversies are maintained and elaborated.

(Controversy = Doubt = Critical positions taken up = Bias = More Doubt)

All the time the talking and thinking about it means elaborations, rumours, inaccuracies entering into the discourse, rather than a progressively more informed debate gradually eliminating unknowns.

Topic J. These comments criticise the presentation. (Not very clever presentation, Poor presentation, Black did not seem to be able to put things well). For these respondents, the public performance of the Report by its authors and other institutions was seemingly not equal to the performance of the critical view (YTV, Greenpeace, the 'media' in general). To an audience sophisticated in reading nuclear related public statements and messages, the Black Report was not given the power of persuasion at its publication, mainly because Black and others did not put in convincing performances. (Black made a comment about preferring not to live in Cumbria, for instance). Moreover, if we accept Wynne's thesis that it is the social performance of an institution's representatives which is the only available meter of competence for a lay-public then a criticism of presentation (social competence in the broadest sense) is very close to a far more fundamental criticism of content and technical competence. Just as 'well presented' is a simple term that might signify perhaps immediately inexpressible deeper congnitions, so criticism of presentation may signify much deeper rooted doubts in the scientific competence of these actors.

Topic K. These are criticisms of the content of the Report (vague, inconclusive and confusing). The Report has too many qualified statements and conclusions which are not helpful to the advance of the debate, or as an instrument of public policy or to the final meeting of uncertainty with certainty.

Topic L. No comment/Not interested/No knowledge - self-explanatory remarks.

Topic M. Related to K. (Vague and Inconclusive) and H. (Report tried to please everybody). No new evidence or revelations, no new solutions, no new explanations or proofs.

- there was no persuasive elaboration of the debate as it was understood by the public. This is a generalised comment. What was required was either a firm 'It's all clear', or 'There is a problem and we're taking drastic measures to ensure nobody is at risk'.

- 'it didn't help anybody by being undecided' - by not being definitive the Report did not solve any group's uncertainties (BNFL's uncertainty about its prestige and continued existence of Sellafield, local public's uncertainty about how to make sense of all the conflicting evidence and argument, environmentalist's uncertainty about the severity of environmental hazard).

- the Black Report is implicitly contrasted with the YTV programme which did have new evidence and new revelations and which therefore had the power to change people's minds.

Topic N. These are generalised criticisms of the credentials, goals and persuasiveness of its conclusions.

- the manifest problem of legitimation. 'I was suspicious', 'I didn't believe', 'Unconvincing ...'. They signify the failure of the Report to clarify and pacify scientific and public doubts, by not appearing to be impartial, by not providing a conclusive proof, by not being comprehensive enough, by not insisting on the urgency of follow-up studies.

Habermas describes a legitimation crisis as the politicisation of those affected by state policy through force of circumstance, into understanding more clearly the forces and powers which give bureaucrats so much control over their lives and livelihoods. These comments too derive from a politicisation by force of circumstance of a lay public for whom, it is suggested, there is a technology-caused threat/risk. They are suspicious because a

a gap is perceived to have opened up between the interests of Sellafield and the interests of the local population, and no full account of Sellafield's interests have been made public. Where before legitimation was not required under the assumptions of technological rationality and progress, now that technological power has to be justified. The term 'Disappointed', 'Not impressed' may have a wide range of meanings: disappointed with the methodology of report, not impressed with the presentation and so on. The sense it has been taken in here is a disappointment with the report as a reassuring public policy instrument and this in part has led to problems of legitimation for the report (of the type described above).

The origin (the evidence used) and the authority (Black as 'eminent scientist') of Black's intervention was too closely identified with the tradition of establishment nuclear discourse to be judged complete or even salient to the reality of 'the public's' concern over nuclear risk and safety standards and procedures in the industry.

Topic P. These points constitute a specific charge that the Black Committee manipulated statistics to prove its own case - in the same way, perhaps, the the producer of the crucial television documentary had manipulated his.

Black manipulated statistics - upwards to show excess more dramatically, or, downwards, to minimise apparent morbidity rates? Usually, we would suggest, people meant the latter - i.e. P. was sceptical of statistics as providing evidence for all parties, and therefore all parties would use it to their own goals. Black's goal, as generally accepted, was to subdue the controversy and protest, therefore he used it to minimise their 'true' message.

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\*Statistics, it might be said, can be misused by anybody, to the ends of any argument, to prove anything. They are therefore no longer a legitimate tool of argumentation. Evidence about morbidity rates for rare diseases is hereby rated completely out of court. Any evidence which can be regarded as decisive will have to come from other sources - notably personal experience of a variety of kinds; of managers, of professionals, of safety procedures, of environmentalists, of journalists etc.



Such comments portray a fall from grace of statistical evidence, scepticism of numerical proofs because each position has numerical proofs which cannot apparently be validated. A common problem in the social sciences but in this case one which tends towards irrationalism. If in a science either side can be charged with misusing data then what is left of inductive theorising? All of the natural sciences as well as the social sciences are called into question. Only confusion is left, and a learned ignorance. (Any authoritative argument - political, scientific, military - requires a complementary baggage of figures and statistics to prove a point. Since opposing arguments can be articulated with equally valid or conclusive statistical evidence it is an option in argument (especially when statistics are accompanied by technical uncertainty statements) simply to reject an opponent's numerical evidence as inappropriate or inaccurate - in the public discussion of scientific problem areas this is especially so.).

Topic Q. These remarks signify criticism of the underlying drift or style of the report (its investigation and its text) as too deferential or sympathetic to BNFL's case of non-culpability. They relate to Black's spoken intention to 'reassure public opinion'. They recognise that the substance of the report carried risks for the nuclear industry and suggest that these were consciously minimised by a reassuring, uncritical style of wording and presentation 'He said what they wanted him to say ...'/'Disclosure couldn't be too risky ...'.

In the latter comment an opposite perspective is taken than in Topic H ('It tried to please everybody ...' or F. ('They did the best they could in the time available')). It is understood that Black (and the nuclear industry) was not simply an innocent investigator and reporter constrained either by F. the state of the knowledge, or by H. the need to appear even-handed but by a need to limit the public relations damage already done to Sellafield by the YTV programme. Black is here seen as conducting a cynical public relations exercise on behalf of the nuclear industry.

(The mode of production of messages is crucial, including the nuclear establishment's reliance on media which are more effectively used by its opponents, but which cannot apparently easily be tailored to its needs (information films always look like hackneyed 50s documentaries - men in white coats grinning, shining machinery etc.)

Topic W. These remarks describe the report as Adequate and Acceptable: that it was good enough as a piece of public policy, but not very interesting or relevant to the public.

Topic X. Other statements - not coded as topics.

### 3.3.2 Ranked topic frequencies

A ranked frequency of occurrence of each of the 21 different topics from the full set of responses is given in Table 9. This Table is as near as we will choose to get to a comprehensive overview of local public opinion of the Black Report in West Cumbria. 150 (14.4% of total responses, coded as topics) are essentially 'non-responses' indicating that the Black Report is an insignificant, forgotten or unremarkable document to many.

The ranking given in Table 9 bears some resemblance to the ranking given in Table 6 - the basic pattern of uncertainty, commendation and criticism discussed earlier is repeated.

A plot of the aggregate internal structure of responses is given in Figure 3. This shows the frequency of occurrence of topics in the chronology of responses, i.e. the first remark, the second, the third and so on. In these series of graphs it may be seen that the doubtful topics (F. and K., ranked (2) and (3) are most frequently a second remark, i.e. frequently hidden by a pre-qualifier of some sort. Topic T. (open for more research) is most frequently a third remark - something which is uttered most frequently within fuller responses. Directly commending and critical remarks (Topic E., B., V. and W.) all will appear most frequently as first comments. What is further clarified in Table 9 and in the above description of the topics (c.f. Table 6)

are the criticisms of the report as they were articulated in local discourse, albeit, statistically in quite small numbers. In their order of occurrence in the Table, they are:

- (1) Report too technical for lay-man.
- (2) Generalised criticism of credentials and conclusions of the report.
- (3) Criticism (general and specific) of report's presentation.
- (4) Critical of Black in particular both as complicitous with nuclear establishment in the production of the report, and as an advocate for this document.
- (5) There were political risks for the nuclear establishment but these were diffused by a deliberately reassuring, uncritical style (or drift) in the report itself.
- (6) Black manipulated the statistics - identical argument as the one more usually deployed against the YTV question (see later).
- (7) The report through its inconclusivity, incompetence of presentation and suspicious motives served only to deepen concern (by increasing doubt?).

### 3.3.3 Topic response patterns

We comment below on a series of Tables (11-20) which show the relation of biographical and graded response features of the respondents to the type of topic that occurred in their responses. In doing so we are interested in highlighting and commenting on some of the dominating patterns which appear in the data, while keeping the sorting procedure quite simple. The figures which make up Tables 11-20 represent the pattern of response (measured by the frequency of repetition of topics) collated over the factors given; Tables 11-15 relate to the biographical details of respondents, Tables 16-20 to responses made to graded questions elsewhere in the questionnaire. Each Table is composed of the same data aggregated over different factors.

Through this interpretation we are successively stretching the collected fragment of discourse in different directions in order to discover the nature of its composition. We are effectively describing the pattern of reproduction (and elaboration) of local discourse about the Black Report by different subjects speaking from (identified) different positions in local society.

TABLE 9 Ranked frequency of topics

TOPIC CODE	FREQUENCY	RANK	TOPIC
L	150	1	No comment/No interest/No knowledge
K	119	2	Report vague/Inconclusive and confusing
F	88	3	Black limited in time available in which to report
X	79	4	UNCODED STATEMENTS
B	76	5	Report as good, comprehensive science - Sellafield not leukaemia cause
T	70	6	Open for more research
E	67	7	Report well presented, both in itself and by the media etc
V	52	8	Report difficult for the lay-person to understand
D	44	9	Report reassuring to me and the community
W	41	10	Report was acceptable/Adequate
N	40	11	Generalised criticism of credentials and conclusions of report
J	33	12	Criticism of presentation
A	32	13	Commendation of report in general terms
M	30	14	Report contained nothing new. No new evidence, proof etc.
R	27	15	Unhappy with Black and his report. General/Critical
G	24	16	Problems of evidence and burden of proof, and their public negotiation
H	18	17	Report was controversial/Used by everybody for their own purposes
Q	14	18	Critical of underlying drift or style of report as too sympathetic to BNF
P	11	19	Black charged with manipulating statistics
S	11	19	Report further deepened 'concern'
C	11	19	Given that Sellafield is not the cause, there is a need for research into 'other causes'
	<u>1,037</u>		

Key

✓ = broadly favourable

? = broadly uncertain

X = broadly unfavourable

- = ignorance or disinterest

TABLE 10

Topics

Frequency as a :

TOPIC CODE	1st comment	2nd comment	3rd comment	4th comment	5th comment	6th comment	7th comment	Total frequency	Rank
A	17	4	10	1	1	1	1	32	13
B	31	25	12	7	1	1	-	76	5
C	22	1	1	2	1	5	1	11	21
D	15	12	10	9	6	1	1	44	9
E	51	14	2	1	-	1	1	67	7
F	18	38	20	9	2	1	1	88	3
G	5	4	2	2	2	2	-	24	16
H	5	4	4	5	1	1	1	18	17
J	22	7	4	1	1	1	1	33	12
K	36	41	18	14	6	3	1	119	2
L	135	10	3	2	1	1	1	150	1
M	6	10	5	7	1	-	1	30	14
N	12	13	9	1	3	2	-	40	11
P	1	4	5	1	1	-	1	11	19
Q	3	6	1	3	1	1	-	14	18
R	14	7	4	1	1	1	-	27	15
S	4	5	1	1	1	1	1	11	19
T	6	16	19	14	10	4	1	70	6
V	25	16	6	5	1	1	1	52	8
W	21	13	4	2	1	1	1	41	10
X	28	23	16	5	6	1	-	79	4
	7	189	306	373	421	442	456		

Method:

Each figure, expressed as a percentage of the column total (the total number of utterances of that topic in the survey), is compared with the 'expected' percentage for that cell (i.e. the percentage figure that would appear if all possible combinations of topics and biographical features were equally likely - the row totals expressed as percentages). Cells are singled out for comment if a variance of over 10 - 15% is found between the actual and expected value. More specifically, what we take to be the variance criterion is if:

$$\frac{f}{z} \cdot 100 - \frac{x}{q} \cdot 100 > \frac{q}{z+25}$$

where    f = cell frequency  
           z = column total  
           x = row total  
           q = summation of all entries in matrix.

No further significance tests are carried out on the data, being deemed inappropriate.

There will inevitably be many interesting correlations which will be missed by this quite coarse sorting method. For instance, Table 16 (Black topics by personal RIHR) shows that 13 interviewees found that the Black Report was fair, unbiased or conclusive (Topic B.) and yet expressed 'concern' over radiation risks to them personally (i.e. they did not accept the reassuring conclusion of the report). However, the cell falls through the net of search because the topic was repeated on only 5% fewer occasions than 'expected', whereas the variance criterion demands 10.3%. It is therefore not distinctive enough.

BROADLY FAVOURABLE REMARKS

Topic A, commendation of the Black Report in general terms, shows a skewed distribution towards male respondents (Table 12) and in conjunction with Tables 14 and 15, it is apparent that Sellafield employees (and possibly retired Sellafield workers) of all classes were the main producers of this remark. This

group was happy the report had been commissioned and that it had been conducted correctly/scientifically in their eyes, and also perhaps had managed to deflect (by its reassurance) some of the criticism that had been aimed at Sellafield and, by implication, themselves.

Topic D. 'report reassuring', has a curious underrepresentation in age group 3 (36-45 year olds); it is difficult to explain the absence of an affirmation of reassurance for this group. The topic again shows a skewed distribution towards male respondents, and again towards Sellafield and related employees (as, indeed, do the favourable statements in aggregate, Tables 12b and 14c). We recall that reassurance was at least part of the purpose of the Black Report, but it seems that of the small number who stated they had been reassured a large proportion belong to a group which was perhaps not directly targetted by Black - male employees at Sellafield; a group with inherently a larger knowledge of nuclear hazard and risk (being subject to slightly higher exposure limits within the plant) and a group who in general, as we have elsewhere (Berkhout and Macgill, 1985) professed to be less 'concerned' about BRL and RIHR\*. What we see from this is that 'reassurance' cannot easily be universally guaranteed; that is, not everybody may be reassured by the same reasons or reassurances, there are differential requirements for a reassurance. The reassurance which a male worker at Sellafield finds may well be based on quite a different range of interpretations and perceptions than that of a different type of person. The task 'to reassure' the whole community may therefore have been doomed from the start.

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\* BRL = Beach radiation levels  
RIHR = Radiation induced health risks

- Topic R. These are remarks critical of the report as deliberate, covert misinformation, alleging Black's complicity in allowing it to become another organ of the nuclear industry's own publicity 'whitewash', 'cover-up' - the general perception of the industry as secret, self-interested, and powerful enough to maintain this self-interested secrecy (including the silencing of apparently impartial government inquiries like Black).
- Topic S. This topic heading represents a number of different comments connected by a basically critical attitude. (i) Report as 'alarming' (comparable with YTV programme). One major similarity between both texts was proof of an increased rate of leukaemia in West Cumbria. It is an extension of Topic H. ('Black brought more controversy') because it is spoken by one of the participants in that controversy, not of an observer of the conflict. (ii) The report contained contradictions/its conclusions didn't match up with the evidence it reported. The report was defective as scientific inquiry.
- Topic T. More research is needed, this is only the beginning. Such remarks have linkages with F. 'They did the best they could'.
- Topic V. The report was difficult to understand for the lay-man. This portrays a lay-man's alienation from technical languages and is a common theme in sociological work on professionalism and the exclusivity of technical languages. It is also something which the nuclear industry professes to be aware of. It brings the Black Report into stark contrast with the YTV programme, which utilised persuasive, flexible, dramatic techniques of information transmission and presentation. The Black Report could not be used as a primary source by the audience of the 'popular' version of events. This audience had to rely once more on the media (TV as well as radio and press) to be informed about the official reaction to the programme. This audience is aware that translations are never completely faithful and that gaps are liable to occur. 'I want to make my own mind up' - but am unable to because it is too technical. (See also the analysis on pp. 24-25.)





TABLE 12A Gender of respondents by Topics for Black Report question

Gender	Topics	Response totals by gender group																						% responses
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	V	W	X	
Male		21	39	5	31	38	50	9	4	16	56	60	7	13	6	7	11	4	32	26	17	36	488	46.9
Female		11	37	6	23	29	38	8	14	17	63	90	23	27	5	7	16	7	38	26	24	43	552	53.1
Topic frequency		32	76	11	54	67	88	17	18	33	119	150	30	40	11	14	27	11	70	52	41	79	1040	<u>100.0</u>

TABLE 13A Places of residence by Topics for Black Report question

Place of residence	Topics	/ A	/ B	/ C	✓ D	/ E	/ F	/ G	/ H	/ I	/ J	/ K	/ L	/ M	/ N	/ P	/ Q	/ R	/ S	/ T	/ V	/ W	/ X	Response totals by place of residence		% responses
																								X	Y	
St. Bees		2	4	0	2	4	5	1	1	6	13	1	7	1	7	1	2	9	3	3	5	2	0	9	76	7.3
Thornhill		6	11	1	2	3	3	2	0	11	8	2	2	2	2	1	1	5	1	1	8	0	7	74	7.1	
Gosforth		1	2	0	3	5	7	1	4	8	11	13	2	3	0	0	0	2	0	4	2	6	8	80	7.7	
Seascale		10	32	8	30	53	44	9	8	16	47	33	23	14	4	4	8	4	4	47	27	22	25	453	43.6	
Bootle		4	9	1	1	3	4	1	3	1	13	16	1	4	2	1	1	1	1	8	4	0	8	86	8.3	
Millom		0	2	0	1	1	3	1	0	0	7	20	0	3	0	0	0	4	2	0	1	2	6	53	5.1	
Egremont		1	4	0	8	3	1	1	2	1	9	17	0	1	1	1	1	1	1	0	0	4	7	62	6.0	
Beckermet		7	3	0	6	7	10	0	0	4	4	10	0	0	0	1	1	0	0	4	4	3	3	66	6.3	
Holmrook/Brigg		0	2	1	1	3	4	0	0	0	3	1	0	1	0	1	0	0	0	2	3	3	0	24	2.3	
Ravenglass		0	3	0	0	0	4	0	0	2	4	5	0	3	0	0	0	1	0	0	1	1	4	28	2.7	
Whitehaven		0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	4	0.3	0.3	
Braystones		0	1	0	0	0	3	1	0	0	1	7	1	1	0	0	0	0	0	0	0	0	1	16	1.5	
Harrington		1	3	0	0	1	0	0	0	0	0	4	1	0	1	0	0	0	0	0	0	0	0	11	1.1	
Calder Bridge		0	0	0	0	1	0	0	0	0	0	2	2	0	0	1	0	0	0	0	0	0	1	7	0.7	
Topic frequency		32	76	11	54	67	88	17	18	33	119	150	30	40	11	14	27	11	70	52	41	79	1040			

TABLE 14A Place of work by Topics for Black Report question

Place of work	Topic		✓	✓	?	✓	?	?	?	?	X	?	X	?	X	X	X	X	X	X	✓	Response total by place of work	%
	✓	✓																					
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
13	24	3	24	28	38	7	4	11	35	21	7	7	3	5	6	1	21	18	13	23	312	30.2	
1	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	2.4	
0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.4	
1	1	1	1	1	1	1	0	0	3	5	0	1	0	0	1	0	2	0	1	2	22	2.1	
0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	7	7	0.6	
0	1	1	0	0	3	0	1	0	5	7	2	1	0	0	1	0	2	1	0	2	27	2.6	
0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	0.4	
0	0	0	1	0	0	1	0	1	2	1	0	1	0	0	0	0	0	0	0	0	7	0.6	
4	8	3	6	7	18	3	2	6	15	29	2	9	2	4	7	3	15	6	3	13	165	16.0	
5	19	2	8	18	15	1	9	8	30	39	12	13	4	3	5	6	19	14	14	23	267	25.8	
7	18	0	9	8	8	4	2	6	17	26	4	5	2	1	5	1	9	5	8	12	157	15.2	
0	1	0	3	2	4	0	0	1	5	5	2	1	0	0	1	0	1	4	2	2	34	3.3	
1	3	0	1	0	1	0	0	0	4	8	1	0	0	1	1	0	0	2	0	2	25	2.4	
32	76	10	54	67	88	17	18	33	117	149	30	35	11	14	27	11	70	50	41	86	1037	100.0%	

TABLE 15A Socio-economic class by Topics for Black Report question

Socio-economic class	Topic ✓	✓	?	✓	✓	?	?	?	?	?	X	?	X	X	X	X	X	X	X	?	X	✓	Response total by S.E.C.	% responses
Professionals	A	8	17	4	12	23	31	3	3	7	29	13	1	5	2	3	2	1	16	10	15	10	19.8	
Intermediate	B	9	16	4	19	18	33	5	7	19	35	22	8	17	5	4	8	2	19	16	11	27	29.2	
Skilled (non-manual)	C	5	10	0	6	7	3	1	1	0	11	21	4	3	2	1	1	2	7	7	4	8	10.0	
Skilled (manual)	D	4	11	1	10	9	8	4	2	2	17	21	6	2	0	0	3	0	13	5	6	14	13.3	
Partly skilled	E	1	6	0	4	5	4	2	1	3	4	19	5	2	0	3	2	2	5	3	2	3	7.3	
Unskilled	F	0	5	0	1	0	1	1	0	0	1	6	0	0	0	1	2	0	1	0	0	1	1.5	
Not applic/no data	G	5	15	2	2	5	8	1	4	2	22	48	6	10	2	2	9	4	9	11	3	16	18.6	
Topic frequency	H	32	76	10	54	67	88	17	18	33	117	149	30	39	11	14	27	11	70	50	41	86	1037	100.0%

TABLE 11b Topic category by age

Age	Topic category					Total responses coded as topics	% topics	% respondents
	✓	?	X	-				
1	2	54	19	30	12	143	13.75	13.4
2	65	102	58	37	26	287	27.60	26.0
3	51	87	51	21	15	219	21.10	21.7
4	56	47	26	20	10	159	15.30	14.5
5	43	44	21	22	10	140	13.50	13.2
6	28	10	13	20	6	92	8.80	11.1
Totals	245	344	188	150	79			

TOTAL 1,006

TABLE 12b Topic category by gender

Gender	Topic category					Total responses coded as topics	% topics	% respondents
	✓	?	X	-				
1	146	113	83	60	36	488	46.9	44
2	124	152	105	90	43	552	53.1	56
Totals	270	265	188	150	79			

TOTAL 952

TABLE 14b Topic category by place of work

	Topic category					Total responses coded as topics	% topics	% respondents
	✓	?	X	-				
1. Sellafeld	102	77	51	21	23	312	30.2	23.6
9. Public admin	28	58	37	29	13	165	16.0	17.5
10. Home	64	88	53	39	23	267	25.8	26.4
11. Retired	50	44	25	26	12	157	15.2	15.8
Totals	244	267	166	115	71			

TOTAL 863

TABLE 15b      Topic category by socio-economic class

Socio-economic class	Topic category					Total responses coded as topics	% topics	% respond- ents
	✓	?	X	-	=			
1. Professional	75	87	31	13	10	206	19.8	15.6
2. Intermediate	73	111	71	22	27	304	29.2	25.5
3. Skilled (non-manual)	32	27	16	21	8	104	10.0	11.5
4. Skilled (manual)	40	51	12	21	14	138	13.3	12.8
5. Partly skilled	18	21	15	19	3	76	7.3	9.3
9. No data	29	51	39	48	16	193	18.6	23.4
Totals	267	348	184	154	78			

TOTAL 1,031

## Key to Tables 11b, 12b, 14b, 15b

- ✓ = broadly favourable
- ? = broadly uncertain
- X = broadly unfavourable
- = ignorance/disinterest
- = nothing said

In the case of Topic D, our previous comments on the "well presented" statement must now be modified to take into account the fact that it was uttered predominantly by Sellafield employees and especially by respondents in classes 1 and 2. This suggests a second strand of interpretation - that the presentation of the report, as technical, professionally conducted science excluded or partially excluded a working-class audience. It turns out that the report itself may have been received and read predominantly by professionals and middle-management and it was towards this group that most of the surrounding paraphernalia of commentaries and explanations were directed. The presentation of the report; the introduction of a new, complex article into a public discourse, therefore, by its nature managed its most significant inroads into the language of males, class 1 and 2 (and their wives, see Tables 12 and 15) who may have worked at Sellafield.

#### Broadly uncertain remarks

Topic F (did the best they could/all I expected) shows a relative deficit among age group 3 (36-45 years old), with slight increases in groups 2 (26-35) and 4 (46-55). Group 3 may have a higher expectation of the report which could not so easily be assuaged by a fairly simple expression of hope for the future of knowledge/policy which F signifies. Alternatively, it may have more to do with the low male representation in age group 3 - 'All I expected' is male language? (About 60% of topic F was uttered by male respondents). An opting into the ideological structure of the Sellafield controversy. As with statements D and E Sellafield workers are over-represented, and as with statement E, it is predominantly respondents in classes 1 and 2 who made this statement (accounting for 73% of occurrences). If Black 'did the best he could' but there was nothing expected of his report then it might as well not have been written - it may merely have been a sop to environmental interests and a hysterical general public, but really in the end very little good come of it. Latterly, this is probably the establishment's own view of the report - certainly our response profiles would suggest that.

Topic H. (Report was controversial) is almost exclusively uttered by women. Commenting about 'the controversy' is clearly one step removed from the substantive issues at stake. Seascale is in the news, the news presents us as being under threat, and the men at the top (the scientists and the journalists) can't decide who's right. Arguments or controversies like this are seen to have a life of their own, feeding on themselves and being perpetuated by a whole range of interests not primarily concerned with what is really at stake - the health of West Cumbrian people. The problems as we know them will be solved by coolheaded, rational investigation of analysis through proper channels which already exist - and not through agitation and confrontation.

Other uncertain statements, e.g. Topic K. (report vague, inconclusive and confusing) which is ranked second in the overall topic schedule shows little discrimination by gender or place of work.

There is no incidence of Topic M. for age Group 4 (report contained nothing new), and little increased frequency for age Group 3 (also for women). M. has a more critical edge than F. (There was nothing new/the report didn't help as against nothing new was expected/Black did the best he could). The higher frequency in Group 3 underlines the deeper expectation of some advance in understanding which this group as a whole had. By comparing this with Tables 12 and 14 we can see that statement M. was made predominantly by women working in the home. (Why is this?). In aggregate, though, the broadly uncertain statements are not very far off the 'expected' values.

#### BROADLY UNFAVOURABLE REMARKS

Topic N., generalised criticism of credentials and conclusion of report, shows a skewed distribution towards women respondents, along with Topic M. (above) which showed a similar distribution (this borne out also in place of work and class Tables, 14 and 15). We would suggest that outside the various commendations and defences of the Report which were predominantly voiced by professional males and Sellafield employees, the purpose of conducting a report was assumed to produce new evidence and

from this to make some form of conclusive statement and to end the controversy (Topic H.). That this was not the case with the Black Report seems mainly to have been voiced by women (respondents in social class 2).

We start seeing then a more definite gender-defined difference in perception of the report. On the one hand a male language which aligns itself to the identified interests of the report: scientific, disproving Y.T.V. and on the other a women's language which is more sceptical about the Report and sets itself outside the on-going controversy.

Topic J. shows an increase for age group 2 (Table 11) and from Tables 14 and 15 we can see that this criticism of the Report's presentation is overwhelmingly by young middle (top) management at Sellafield and their wives. We can therefore elaborate on what we said earlier about this criticism: middle management realised the criticality of the Report's presentation as representing for its uninformed audience a measure of its worth or adequacy; some subsequently found the presentation ineffective or poor. The Report was deemed to have served Sellafield in general badly, and perhaps even was interpreted as having misrepresented these respondents (a group of respondents who had been most implicated by the beach radiation and child leukaemia issues - being on the whole young parents).

#### No comment

There is a slight increase in Topic L. (No comment etc.), for age group 1 and women. This is probably composed of the younger end of the age cohort school pupils etc. who were not engaged by the Black Report. There is a complementary low non-response for age group 3 (only 9.6% of coded topics). For this group, then, Black was commented upon more often, but commended less often (than aggregated averages) (A group possibly more interested in Black, with high expectations of the Report, but in the end perhaps more concerned with the difficulties of the Report?).

### 3.4 Topic response patterns according to expressed concerns

#### 3.4.1 Background

In an earlier section, survey findings on the general pattern of concern (and lack of it) among local communities were summarised (see section 2.5 and Tables 1 and 2). It is axiomatic of our approach to the analysis of local community attitudes that there exist distinct social stratifications and linguistic patternings which underlie and complement these summary indicators.



We have begun the task of delineating this social structuring of discourse in the previous section. We can enhance these interpretations by analysing responses (designated by topics) according to the respondent's answers to key graded questions. These answers have been described as resembling a self-consciously political position within the controversy surrounding the Black Report\* (Macgill and Berkhout, 1983), so that their analysis through a disaggregation of topics will reveal how these various positions are substantiated discursively. The analysis below also proves that behind the mute graded question statistics lies a highly complex diversity of reasonings - proof that to say 'concerned' is not a simple matter.

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\*Answers to these questions are considered to be indicative both of some form of expression of subjective attitude and (because the terms 'not worried', 'concerned', and 'anxious' are not neutral in their meanings) of some form of socially accountable declaration which acknowledges the politics of answering them. A statement of 'concern' about child radiation-induced health risks reverberates through the whole fabric of needs, dependencies, trusts and loyalties which structure the life in the area around Sellafield; needs for employment, dependency on the workforce to do their work diligently, trusts in the management to properly inform everybody and loyalties of friends, relatives and the wider local community in balancing responses to a questionnaire conceived outside the area. This is not to claim that the three options 'not worried', 'concerned', and 'anxious' comprehensively represent the range of positions possible but that they are a simple device for distinguishing broadly between such positions.

### 3.4.2 Topic patterning according to responses about personal RIHR (Table 16)\*

Topics A., D. and E. (Commendation of report and findings, Reassurance of report, Good presentation), show increased incidences from respondents who answered 'Not worried' about risks to themselves. This is pretty much as expected: those who are unconcerned about possible 'risks' are those who were most positive about the report, and vice versa; those who took the report at face value were able to suspend concern and give 'Not worried' answers. Contained in this is the implicit assumption perhaps that 'everything is being taken care of properly by responsible technologists - even if they do not quite know all the answers at least they won't be doing wrong by local people'. So, pronouncements from Authority that this remains the case (and Black can be seen as falling firmly within this tradition), can therefore easily be accepted as satisfactory or correct.

There is also an increase for Topic J. (a criticism of the presentation) for 'Not worried' respondents, although this is not as marked as for Topic E. So both 'Good presentation' and 'Bad presentation' are over-represented here. The presentation of the report to an 'outside world' can be seen as crucially important to 'Not worried' respondents. The Black Report had to be seen both to exorcise local concerns, but also to prove to an audience outside that nothing was amiss in West Cumbria - to remove the stigma that YTV had placed on the area, and to prove to this same outside audience that West Cumbrian people were not naive or foolish to believe Sellafield to be safe. This reaction of the rest of the world to the Black Report, however, remains unclear and arguable for West Cumbrians who themselves are unconcerned about risks.

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\*There is a methodological contradiction in carrying over the technique of establishing a variance criterion from the previous biographical section. This arises out of the qualitative difference between the vertical axes in Tables 11 to 15, and those in Tables 16 to 20. The latter being already linguistic while the former are representative of a social empirical classification. This means that ex ante we do not expect that 'all possible combinations of topics (and graded responses) are equally likely'. Nevertheless it would be inconsistent with our stated aim of investigating the plurality of reasonings if we were to impose a rigid comparison say between the graded question responses ('Not worried' etc.) scale and the three categories of response to the Black Report ('Broadly favourable' etc.). These categories would prematurely collapse the diffuse and fluid structure of discourse into a fairly arbitrary set of opposites where continuities and connections might well exist.

TABLE 16      Topic frequencies according to responses about personal radiation-induced health risks (RIHR)

[illegible]

TABLE 17  
Topic frequencies according to responses about 'other adult' radiation induced health risks (RIHR)

Topic																										Other adult RIHR	Other adult RIHR response frequency	Other adult RIHR % response
✓	✓	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	V	W	X	/	X	Y	Z		
24	57	5	40	52	63	9	14	22	72	94	21	16	10	9	12	6	44	35	30	49	684	65.8						
4	13	6	13	15	16	6	2	10	35	34	8	18	1	3	8	5	23	15	10	16	260	25.0						
0	1	0	0	0	6	1	0	1	6	8	1	4	0	2	5	0	1	1	1	10	48	4.6						
2	3	0	0	0	2	1	1	0	1	8	0	0	0	0	0	0	2	0	0	3	23	2.2						
2	2	0	1	0	1	0	1	0	5	6	0	2	0	0	2	0	0	1	0	1	24	2.3						
32	76	11	54	67	88	17	18	33	119	150	30	40	11	14	27	11	70	52	41	79	1040	100.0						

Topic N. shows a skewness towards 'Concerned' responses. That is, the Report's failure to 'Clarify and pacify scientific and public doubts' or to present itself as a definitive 'truth', seems to be the attitude towards the Black Report most significantly related to a 'concern' over personal radiation induced health risks. This<sup>also</sup> follows quite simply. Concern, as we have seen earlier, was significantly increased by the YTV programme, and a suspicion of Black (as a legitimate source, as a convincing statement) at a basic, almost intuitive level would only sustain that concern. What is also interesting about the distribution is the quite large number (19) of 'N' responses from people who claimed to be 'Not worried'. For these views we can take the Black Report to be completely incidental. It is acknowledged as inadequate but for quite other reasons: radiation induced health risk is stated not to be a threat.

Topic R. is over-represented against 'Anxious' responses (although the numbers are very small). The Report as 'cover-up' or 'whitewash' is the type of argument expected from an 'opponent' of Sellafield/nuclear hazards (a deep, declared suspicion of the information available to the public on nuclear safety etc.). Once more what is interesting is that the majority of these responses (Topic R.) were made by people who declared themselves 'Not worried' about personal RIHR. It is clearly quite possible for adults to reject the Black Report as an obscurantist, mystificatory document, written to the nuclear industry's own prescriptions - and at the same time to reject the inferences about nuclear risk to adults that might be made following the YTV programme. This all becomes clearer in the discussion of patterning according to child RIHR.

#### 3.4.3 Topic patterning according to responses about other adult RIHR (Table 17)

Topics A., D. and E. all remain over-represented among 'Not worried' responders, although to a slightly lesser extent, Topic B. (the Report as good, fair, science) is over-represented to about the same degree.

Topic H. (the Report as generator of renewed controversy) from being under-represented among 'Not worried' respondents for 'personal' RIHR is markedly over-represented in this same group for 'adult' RIHR. ie. four people who said they were 'Concerned' about personal RIHR, said they were 'Not worried' about RIHR to other adults. This may relate to an appreciation that there are 'critical groups' (the standardised exceptions in all radiobiological models). (Alternatively, are they being bloody minded about the 'controversy'? is this some measure of the devisiveness locally which has been caused by the whole issue?).

Topic N. shows an 80% over-representation among 'Concerned' responses to 'other adult' RIHR. In this response all or part of the rest of the community is not satisfactorily covered in Black "a problem of an unknown magnitude still exists in my mind because Black did not sort it out".

Topic P. is the most markedly over-represented among 'Not worried' responders for 'other adult' RIHR. This is an allegation of the manipulation of statistics and improper scientific practice on the part of Black. In this response adults generally are clearly not considered as implicated in Black's findings. And they will be implicated only with the discovery of completely new evidence.

Topic R. is over-represented in the 'Anxious' response group, 'whitewash' means there is some deeper, secret evidence which would further underline our concern by proving some negligence or even malicious intent on BNFL's part. Again there is a high 'Not worried' proportion.

#### 3.4.4 Topic patterning according to responses about child RIHR (Table 18)

This gives generally a far more polarised distribution of topics. This (risks to children) is an issue along which lines are drawn, on which opinions are determined. This is one of the local discourse's focal points, and the answer given will contain allusions to and resolutions of problems which may initially have been thrown up elsewhere (how far you can trust management, how legitimate journalistic reports on technical matters are, and so on - to be expanded?).

Topics A. and B. are both heavily over-represented among 'Not worried' responders. Topic D. also shows a positive variance but not to the same degree. But only in the case of A. is the pattern anything like conclusive. An unequivocal, generalised commendation of the Report seems to be firmly equated with unconcern over the risk of child leukaemia. There is no room for criticism within it, Black = Good, The Rest = Bad. From Topic B. it seems that the scientificity of the Report may well be a crucial component of any argument for unconcern, but 39% (28) of these statements were made by 'Concerned' or 'Anxious' respondents for this group, even the guarantee of good science was not enough to assuage 'Concern'. There are radiological causes of disease beyond science which are as yet unknown.

In this sense Topic B. comes to resemble Topics F. and G. We would surmise that there are therefore two distinct positions on 'Science and the Black Report':

Either (i) The nuclear industry (and to some extent Black also) knows nuclear physical and medical science, they are the responsible custodians of that knowledge, which may include restrictive societal procedures, but which we trust.

Or (ii) Medical science does not yet have the solutions to the problem of child leukaemia rates in West Cumbria. These rates are not necessarily connected with nuclear reprocessing or discharges at all.

**TABLE 18** Topic frequencies according to responses about child radiation induced health risks (RIHR)

Topic		/	/	?	/	?	?	?	?	X	?	=	?	X	N	M	L	K	J	H	G	F	E	D	C	B	A	Child RIHR response frequency	Child RIHR % responses
Child RIHR																													
Not worried	20	45	3	31	33	40	6	6	18	45	71	8	6	6	1	3	1	23	24	19	29						438	42.1	
Concerned	6	21	6	21	28	44	9	10	12	54	50	18	21	3	10	14	7	38	24	18	30						444	42.7	
Anxious	2	7	1	0	3	4	2	1	3	16	22	4	12	2	3	9	3	5	4	1	17						121	11.6	
Cannot say	1	1	2	1	2	1	0	0	0	2	5	0	1	0	0	0	0	3	1	2	3						25	2.4	
Don't think	2	2	0	1	0	0	0	1	0	2	2	0	0	0	0	1	0	0	0	0	1						12	1.2	
Total frequency	32	76	11	59	65	88	17	18	33	119	150	30	40	11	14	27	11	70	52	41	79						1040	100.0	

TABLE 19 Topic frequencies according to views about beach radiation levels

	✓	✓	✓	?	✓	✓	?	?	?	X	?	X	X	X	X	X	X	X	?	X	X	✓	row %
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	V	W	X	totals	
not worried	19	50	4	34	43	45	6	4	19	45	68	13	10	3	2	3	2	30	27	18	29	474	45.6%
concerned	11	20	5	18	21	35	9	13	12	48	50	10	16	6	9	14	5	34	18	19	36	409	39.4%
anxious	2	5	1	2	2	6	2	1	1	20	19	6	13	2	3	9	4	3	5	3	11	119	11.5%
cannot say	0	1	1	0	1	2	0	0	1	6	12	2	1	0	0	0	1	3	2	1	3	37	2.6%
totals	32	76	11	54	67	88	12	18	33	119	190	30	40	11	14	27	11	70	52	41	79		

TABLE 20 Topic frequencies according to views about radiation in fish and other seafood

	✓	✓	✓	?	✓	✓	✓	?	?	?	?	?	?	X	?	?	X	X	X	X	X	X	?	X	?	X	✓
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	V	W	X	Y	Z	aa	ab	ac	ad	ae
not worried	25	56	6	44	49	57	12	25	63	89	17	19	6	6	9	3	42	33	23	35	631						60.8%
concerned	7	13	3	7	15	24	3	6	5	32	35	8	12	5	4	9	7	21	13	10	26	265					25.5%
anxious	0	5	1	2	0	3	2	0	1	15	12	4	8	0	4	7	1	2	3	1	11	82					7.9%
cannot say	0	2	1	1	3	4	0	0	2	9	13	2	1	0	0	1	1	5	3	7	7	60					

A noticeable feature of Topic D. is the very large number of respondents who remain 'Concerned', though find the Report reassuring.

Topic H. from being over-represented among 'Not worried' respondents for 'other adult' RIHR and among 'Concerned' respondents for 'personal' RIHR shows the latter patterning for child RIHR. This is difficult to interpret. The topic covers a set of observations about the functioning of a nationally available dispute or controversy. Sellafield is always on the news and is always treated in an alarmist way, there is no way around this style of presentation and nuclear news. The Black Report meant that Sellafield was in the news again, reminding people. It is a topic about nuclear signification and how it encumbers any debate, investigation, campaigning around things nuclear.

That a large number of 'Concerned' respondents made this statement suggests that the power of this prevalent signification now has an influence on local opinion too. Although many local people wanted to distance themselves from media representations - of the plant, of themselves, of the risks - the fact that the controversy is taking place at all will have affected some people and not others. Six commented on the controversial nature of Black and declared themselves 'Not worried' about child leukaemia.

Topic J. is over-represented among 'Not worried' respondents. This topic is similar to H., but is an active statement about the nuclear industry's public relations effort, not a reactive, subjected statement about its maltreatment by the outside world. It comes from a discourse which is still confident of the industry and says that it is necessary for it to defend itself. Criticism of the public relations effort is therefore 'positive' or 'helpful' criticism in the main about how the industry should better defend itself in the future. In this case Black is not necessarily identified directly with the industry itself - perhaps it is saying that Black as a naive beginner in nuclear controversies should have been more careful about his presentation, and further, should not have 'tried to please everyone'.



Topic L, no comment, etc. is overrepresented among 'Not worried' responses.

Topics M., N., Q., R., S., and T. are all highly overrepresented among 'Concerned' respondents. These are the most definitive patterns of criticism to come out so far. These six topics constitute the distinctive elements of 'Concerned' discourse or doubt.

Topics M., N. and T. (the document fails to dispel doubt for a number of reasons (different for each topic)) have less skewed distributions than Topics Q., R. and S. (the document actually increases alarm or is part of a conspiracy of disinformation or silence). These six topics therefore seem to have proved themselves as key components of a revealed scepticism about the contents, competence, and presentation of the Black Report. They constitute a rejection of the relevance of the Black Inquiry by concerned individuals, criticism of its substance and a failure to offer reassurance.

#### 3.4.5 Topic patterning according to responses about beach radiation levels (Table 19)

We would expect many similarities here with the patterning for child RIHR, but there is also room for new patterns through the complex relation of the two issues already analysed in earlier crosstabulations (see above; also Berkhout and Macgill, 1985).

Topics A., B., D. and E. are highly overrepresented among 'Not worried' responses. In other words, positive remarks about Black correlate well with being 'Not worried' about beach radiation levels. The pattern seems more consistent than for 'personal' and 'other adult' RIHR. In comparison with 'child' RIHR response Topics B., C. and D. are distributed in similar ways, but there are some slight differences, with Topic A. appearing as more important to the 'Not worried' child RIHR responses, Topic E. appearing as more important to the 'Not worried' responses about beach radiation levels. (The Black Report did not deal with beach radiation directly. Why, then, is comment about its presentation associated with unconcern about beach radiation levels? Perhaps Black is seen as a return to 'good PR' on behalf of scientific sense (cf. the YTV programme exaggerations and the November 1983 beach incident blunder which was bad PR but insignificant in risk terms)).

Topic J. (criticism of presentation) is also overrepresented among 'Not worried' responses. The pattern is similar to that for 'personal', 'other adult' and 'child' RIHR; see corresponding comments in the relevant sections above.

Topics G. and H. are overrepresented among 'Concerned' responses. H. especially draws a very dramatic pattern: 72% of Topic H. responses were given by people 'Concerned' about beach radiation levels. There seems to be a definite connection between controversy at a national level about the YTV programme, the beach incident and the Black Report - the opening of the Sellafield wound which has lead to palpable concern over the immediate environment (the beach in a more dramatic way than concern over the risks which that hazardous environment may hold.

Topic L. ('No comment') is again very overrepresented among 'Not worried' respondents: for people who claim not to know anything, the best thing to say is 'Not worried': a similar pattern as for child RIHR.

Topic N. (but not M.) is overrepresented among 'Concerned' responses about beach radiation levels, but not as dramatically as for child RIHR. The problem of the legitimization of the Report does not bear directly on the beach incident, although the more general issue of technologists legitimate control of sea discharges is related.

Topics Q., R. and S. show very similar patterns to the child RIHR reponses. Deep criticism of the Black Report's methods and perspectives come from people who mainly are concerned about child RIHR and beach radiation levels. Topic T. (open for more research) does not show up in the tabulation as significant.

#### 3.4.6 Topic patterning according to responses about fish and sea food radiation levels (Table 20)

Topics A., B., D. and E. are all heavily overrepresented among 'Not worried' responders.

Topics R. and S. are both highly overrepresented among 'Concerned' responders.

Although the hazards of eating local fish have been an issue (fishmongers putting up signs saying 'Fish NOT local', apocryphally) it is quite a peripheral and simple issue compared with beach radiation levels or RIHRs. The responses may therefore be used simply to plot a base pattern of opinion between those who used Topics A. to E. (positively affirming to Report) and Topics F. to S. which had a range of criticisms of it.

First, this basic pattern seems to bear out our categorisation into topics - with a variety of positive evaluations correlating strongly with 'Not worried' responses, and the most extreme rejections of the Report correlating consistently with 'Concerned' and 'Anxious' responses. Second, none of these topics are exclusively related to any one position on radiation induced health risks or radiation levels. That is, there is a great deal of ambiguity and complexity to be found below the generalisations which we have limited ourselves to commenting upon. Third, within the structure of the discourse (as we have plotted it) there is a wide flexibility possible at a broader level in the way views are put. Between Topics F. and R. there is a wide area of dispute and opinion which has generated a set of patterns from which the general characteristics of local discourse may be derived.

The above series of analyses are as far as we choose to develop our present investigation of the reception of the Black Report in West Cumbria.

#### 4. Closing comments

The findings reported in the present paper will be contributed towards a wider evaluation of the significance of the Black Inquiry as a public policy initiative in the nuclear/risk management area. The analysis above has revealed the extent and complexity of comment among West Cumbrian communities, demanding an open approach to survey design and patient reading on the part of interested observers if their positions are to be adequately understood by a wider audience.

One may, in general, be left with the impression that underneath the varied commentaries about the Inquiry and its Report, Black was no more relevant to the majority in West Cumbria than their actual concerns were to its instigation: Black was a political response to a panic evoked by a highly controversial and more than usually publicised television programme. West Cumbria was and still is peripheral to a centre with more powerful interests and commitments. At the same time, central government was and still is a remote image to the localisms of West Cumbria.

Nonetheless, the terms in which local people speak give clues as to what more they might have been expecting; telling judgement on the quality and significance of this Inquiry in their eyes; and very suggestive indications as to the nature and roots of any lingering risk concerns, or active rejection of any cause for anxiety. They are responses to a controversy imposed on them externally (by a London and Yorkshire based television company) and managed by a distant figure from the South.

In a broader context, the terms in which local people speak of the "risks" and the "controversy" are indicative of the depth and complexity of public "risk attitudes" in Britain (and elsewhere). What seems imperative in understanding the nature of people's concerns and the relevance of the actions of authority is to get beyond the over-simplistic (and often false) idea of "the public" as being irrationally fearful, hopelessly misinformed or unwarrantedly trusting. The fact is that there is an organic, elaborate web of "risk attitudes" - objective social phenomena. It will be the development of this large, complex, volatile sphere which will have to be reckoned with in Black Reports, other 'expert' inquiries, science, and the industry's own legitimization and public relations, if their public

statements are to be effective - engaging with the people whose situation they address and to whom, to a large extent, they seek to speak. The task is one of fascinating difficulty and complexity. Risk attitudes derive from a well of experience, argument reflection, agreement and resistance. They cannot easily be changed, shaped or broken down by authoritarian pronouncements and assurances.

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**Figure 1**

**Location map : Sellafield and nearby towns and villages.**

**Survey undertaken in places underlined**

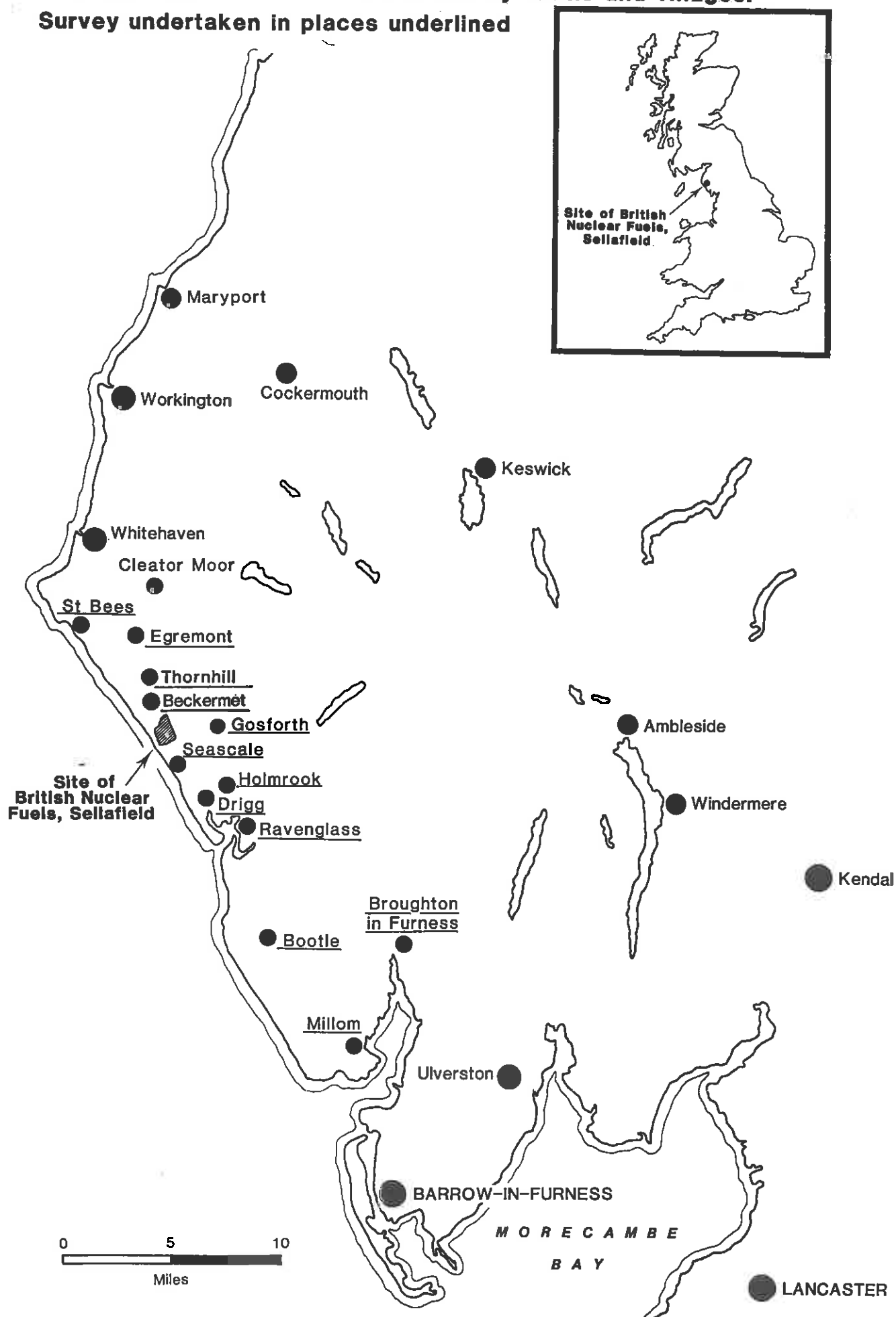
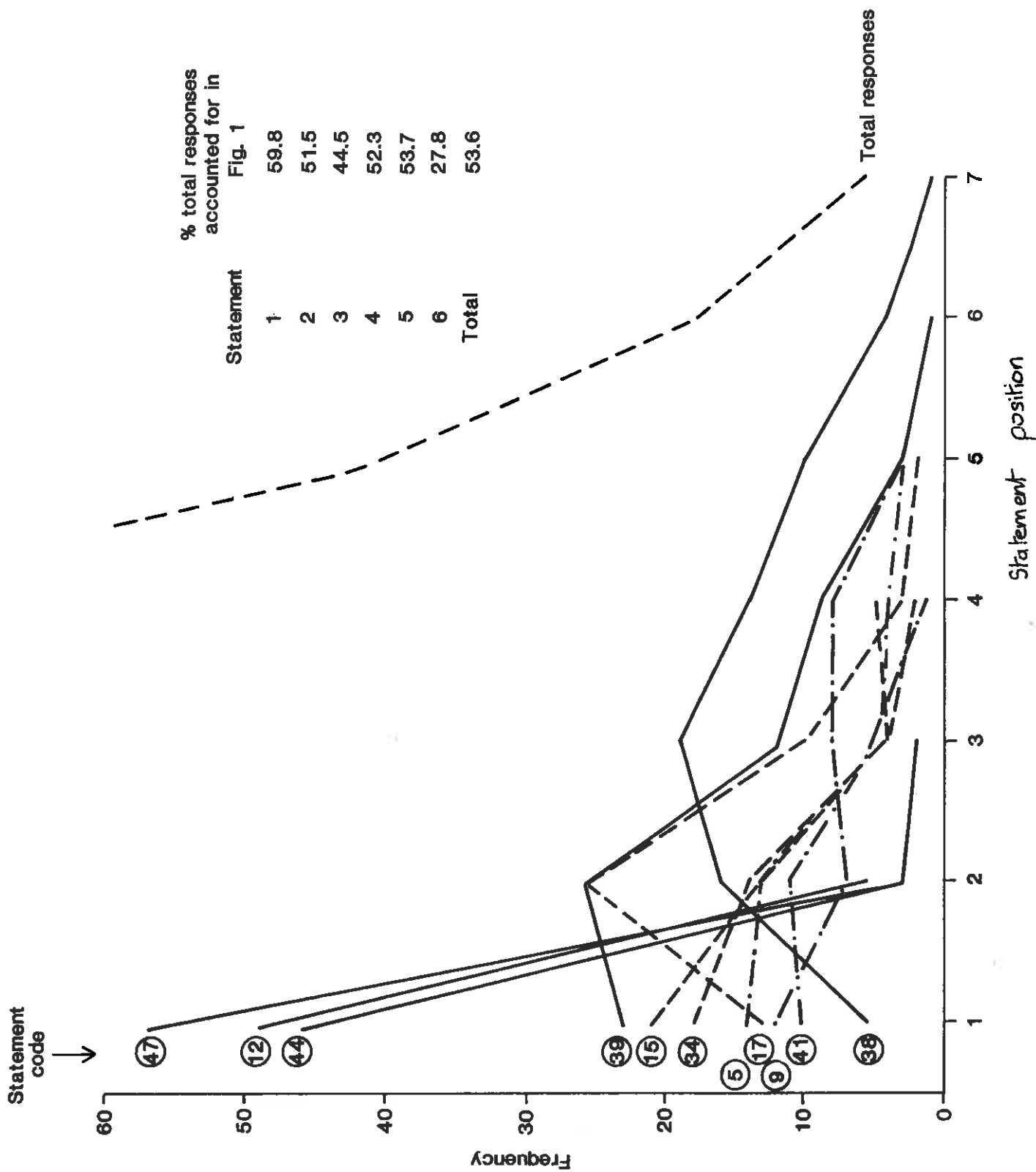


Figure 2. Disaggregated analysis of statement sequence





APPENDIX A Views on discharge incident

Clues to local people's general positions towards Sellafield can be found in the way they speak about what has been widely described (in official, company, environmentalist and other circles) as one of the (if not the) most serious operational errors in the B.N.F.L.'s history - the discharge into the sea in November, 1983 of a tank of radioactive effluent that should have been held for further reprocessing. Radioactive materials were subsequently washed by the tides back on to the local coastline. The incident caused the Department of the Environment to issue advice to members of the public not to make 'unnecessary use' of a 20 mile stretch of beach, advice which held until well into the following summer. Monitoring of beach radiation levels was also stepped up considerably, and B.N.F.L.'s discharge authorisations were officially reviewed.

The survey questionnaire included the question 'What are your feelings about the pipeline incident in November, 1983 and the associated beach contamination?'. The main types of comment given in response to this question are grouped according to broad topic types and presented in Table A1. The frequency with which each comment appears, in aggregate, as a 1st, 2nd, 3rd, 4th or 5th remark in respondents' complete replies is indicated in the Table.

Rank	Overall frequency	1st	Frequency as a 2nd 3rd 4th remark	5th	Code	Description
1	114	81	33	--	H	Comments, generalised or specific, that "it shouldn't have happened".
2	108	61	29	9	E	The discharge was one of those minor, careless, human errors.
3	100	62	29	9	P	Displeasure, anger, concern at incident.
4	94	17	39	24	D	Generalised charge of bias, exaggeration and sensationalism by media and Greenpeace over incident.
5	71	35	25	11	Q	A serious error; incompetence and bad management.
6	69	20	25	11	M	Discharge may not have been a mistake; Greenpeace highlighted what may have been routine.
7	65	22	21	16	A	Denying risks and claiming unconcern; firmly unperturbed by the controversy.
8	43	--	19	11	G	Ambiguous and confusing information about the incident and its effects given out by B.N.F.L.
9	42	11	15	20	J	Generalised comment about safety standards in the nuclear industry.
10	41	41	--	--	S	Extreme concern and anxiety expressed in general terms.
11	37	11	16	10	R	Delay in B.N.F.L.'s announcement of the incident "We should know what's going on".
12	27	--	10	9	V	Greenpeace actions alienate the local general public.
13	24	24	--	--	Y	Don't know/No comment.

TABLE A1 Topic frequencies, discharge incident question (main types only)

Analysis of comments associated with Question 5E 'Do you believe there is a significant excess of cancer in this part of Cumbria? If so how do you think this might be explained?'

Number of responses	Response code	Type of comment/response
13	1	There have always been cancers in the area
( 8	2	There are causes other than radiation (unspecified)
( 1	2A	Sewerage
( 9	2B	Asbestos pipes and local water
( 5	2C	Cancer virus
( 6	2D	Chance
38	2E	Fertilisers
( 4	2F	Granite/geology
( 1	2G	House materials
( 1	2H	Sellafield bug
( 1	2	Seaspray
( 1	2	Mushrooms
15	3	Same levels across whole country/Are just publicised here
13	4	Are cancer clusters elsewhere
20	5	Not enough information to decide/experts should know and should tell us
7	6	Sellafield would appear to be the only possible explanation
2	7	It is just natural pockets of cancer
3	9	Statistics can be used to suit anyone's purpose
11	10	BNF and radiation can't be ruled out as a cause
10	11	It is not locals, its newcomers affecting statistics
3	12	There is low radiation and/or low cancer around here
7	13	It is difficult to judge/laymen can't judge
6	14	They should be trying to find out what causes the cancers
3	15	It has already been proved there is no link
3	16	I don't believe it is Sellafield so look for other reasons
4	17	It depends on who you believe
3	19	I believe what the Black Report said
3	20	Workers at BNF pick up contaminants and spread them (accidental)

## Commentary on Method and Responses

- (i) Question 5E asked 'do you believe there is a significant excess of cancer in this part of Cumbria - tick 1 of 3 boxes.

And then asks for explanations, and asks how sure they are of their answer.

- (ii) A number of respondents made additional comments in support of the boxes they ticked.

Here an attempt to illustrate the nature, range and content of all these comments is made by coding commonly used remarks and totalling up those who used them.

- (iii) 145 people made comments, some made more than. Most comments have been incorporated. Those making comments included all types of response to question 5E, i.e. box ticked.

- (iv) Broad observations.

(a) 53 people or 12% of total questioned attempted to minimise claims of cancer clusters by saying that cancers occurred before BNFL were there or levels are same across the country, or clusters exist elsewhere or are natural phenomena or are due to the large number of transient workers (codes 1, 3, 4, 7, 11).

(b) 38 people suggested that other reasons were singly or in connection with radiation responsible. (code 2).

(c) 31 people felt in various ways that they did not have enough information (or didn't know which source was right) to form an adequate opinion (codes 5, 14, 17) but medical or scientific people should try and find out.

(d) Interestingly 3 people involved in such statistical work found no cause for believing clusters existed, i.e. 1030B-A BNFL Medical Officer  
3029B-A Community Registrar of births/  
deaths and marriages  
2002A-Community Health Committee.

### APPENDIX C    Views on Y.T.V. programme

Over 80% of the people interviewed in the survey had seen the Yorkshire Television programme 'Windscale, the nuclear laundry', either at the time of its initial broadcast (2nd November, 1983) or subsequently on video. Elsewhere (Berkhout and Macgill, 1985\*) an in depth analysis to their response to the survey question 'What did you think of it?' is given. Here we merely rank and comment briefly on the main topics arising in their responses (Table C1).

One of the main problems with this rankings is that Topics D., E. and F. are all closely related and can be distinguished only by employing very subtle readings of them. If they were aggregated together they would amount to fully 33% of all responses to one question. This is an astonishingly uniform response pattern which could almost be described as a consensus although this is not fully apparent in the ranking as it is given here. Taken together with the high rankings of Topics B. and C. (ranked 2 and 6 respectively) the local reaction is shown to have been almost universally hostile.

Aggregating Topics P., Q. and K. we find that only 11.8% of comments were commendatory.

How is this very strong conformity of opinion composed?

One needs to remember that none of these reactions is fresh or spontaneous. The programme was widely discussed locally and all reactions have therefore undergone revision and transformation in the

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\*'Child leukaemia around Sellafield: local community reaction to the television documentary 'Windscale: the nuclear laundry', School of Geography, University of Leeds.

TABLE C1

*Type	Frequency	Rank	Code	
X	259	1	F	Criticism, general and specific, of scientificity, bias of programme.
X	99	2	B	Deep criticism of premises, methods and inferences of the programme.
	92	3	X	Non-coded remarks.
	79	4	V	No comment.
X	72	5	D	Specific, hostile criticism of the character of journalism.
X	70	6	C	Attribution of consciously 'political' motives to programme makers.
✓	57	7	P	Generalised appreciation of the programme.
O	56	8	S	Demand for better information and openness from nuclear industry.
X	55	9	E	More general criticism of 'the media'.
O	43	10	J	Indirect affects of the programme on local feelings, business and image.
✓	43	10	Q	Comment on factuality and interest of programme.
O	38	12	T	Alarm, fright at revelations of programme.
✓	36	13	K	Generalised comment that programme was useful for raising the issue.
O	30	14	M	Confusion at the legitimacy/credibility of information sources.
X	28	15	G	Localism.
O	26	16	L	Expression of some doubt about some of the evidence and the programme's conclusions.
X	23	17	W	Criticism of the interview with B.N.F.L. representatives after the programme.
O	22	18	H	Comment about local personalities.
X	13	19	N	Criticism of the technicality of the programme.
O	10	20	R	The need for further research now that the problem had been highlighted.
X	7	21	A	Active negation of the whole programme.

\* X = Critical      ✓ = Commending      O = Doubts and other effects

13 months between the broadcast and the survey\*. The responses prove once more to be a deeply intersubjective phenomena, (there was a high degree of uniformity in the overall response patterns). They amount to a communal response which is technically informed (it can state categorically that the programme was 'unscientific') and which asserts its own competence to make such a response. As we have seen in the analysis of topics these responses are often based on a particularly local kind of knowledge or competence.

It may be said that in making these comments we are remaining too distant from the truth of what is said in local discourse, that by doing this analysis and stressing the conformity of responses we are somehow belittling each individual response as just one more phrase to play around with. A critical response generally wants to be regarded as individual, we want to 'make up our own minds'. West Cumbrians too will say that they made up their own minds about the Y.T.V. programme and that this reality has been lost in our analysis. We do not say that nearly 50% of all responses were critical of the programme because it was a bad and unscientific programme and therefore deserved to be criticised. That 'truth' would be far more contentious than the interpretation we have given which stresses intersubjectivity and local cultural cohesion and particularity in a way that conforms with the data. What this data and its interpretation in this manner 'proves' and explains is the means by which public opinion is socially constructed and that this construction begins in the material experiences of everyday life. It is the analysis of controversy and so must try to stay as far as possible outside that controversy.

\* One of the major events to impinge on these evaluations was the discharge of untreated crud also in November 1983. Although there was a separate question dealing specifically with this issue it seems highly likely that responses to the Y.T.V. question were also in some way tempered by it.

APPENDIX DLocal opinions about the purpose of the Black Inquiry

The purposes which the Black Report was deemed to serve by the local community - as much as they could say, are given in Table 1. Applying a similar, though coarser approach to analysis to that described in the text, people's full responses to this question were divided into individual statements, allowing a maximum of three statements per respondent (very few people gave more).

The explanation of the coding is as follows, with comment on each statement type.

(i) Code (1) 'To allay fears'

This comment suggested that the respondent believed the inquiry was commissioned to allay the fears of the public. In stronger terms this comment was often preceded by the words "It was a Government ploy to ...". This code was used to indicate a comment which saw the Report as being commissioned to calm people's fears, stop them worrying or reduce panic. When used this code represented a definite but perhaps discrete 'placebo' effect. Often this response specified 'Local Fears'.

This was the most common comment and was used by 23% of the sample largely as their first comment.

(ii) Code (2) 'As a political expedient'

This was used to code 10 people's replies. It is a broad statement which suggests it was a wise course of action for the Government to follow though not necessarily something they had to do (see Code (12)). This comment does have a hint that the decision to have an Inquiry was a hollow one backed by little political determination. = 2% of sample



TABLE 17 Responses to the question 'Why do you think the Black Report was commissioned?'

Frequency of occurrence as 1 a 1st statement	Frequency of occurrence as 2 a 2nd statement	Frequency of occurrence as 3 a 3rd statement	Total	Code	Statement	Rank order of statements
81	22	2	105	1	'To allay fears'	1
5	3	2	10	2	'As political expectant'	14
33	--	--	33	3	'Not heard of it/Not know much about it'	9
52	20	5	77	4	'To investigate the cancer clusters/To see if cancer clusters are linked to BNF'	2
27	11	3	41	5	'To answer the allegations of the press/media'	4
26	9	5	40	5A	'To answer the allegations of YTV'	5
10	3	1	14	5B	'To answer the allegations of Environmental Groups' - 5A, B, C suggest publicity was the reason for the Inquiry	13
10	6	1	19	6	'To reassure people that BNF is safe'	10
25	11	3	39	7	'To report on/investigate November incident'	6
--	4	--	4	8	'To find out who is responsible'	17
1	--	1	2	9	'To establish what radiation levels were experienced in the area'	19
6	8	1	15	10	'To identify what the health risks in the area were'	12
42	12	4	58	11	'To answer to the public's concern'	3
26	9	2	37	12	'The government had no choice'	7
18	15	3	36	13	'Sir Douglas Black was to be independent inspector ...'	8
10	3	2	15	14	'Sir Douglas Black was biased/establishment'	10
1	1	1	3	15	'Hopefully Sir Douglas Black is unbiased/OK'	18
9	--	--	9	16	'To clear the air'	15
5	9	3	17	17	'To help BNF counter the media and Environmental arguments'	11
38	2	--	40	18	'No idea'	5
--	3	3	6	19	'To find out what action should be taken'	16
3	3	--	6	20	'To get it out of the limelight'	16
1	--	--	1	21	'Because of GP's concern'	20

(iii) Code (3) 'Not heard of it/Not know much about it'

This response was made by people who either hadn't heard of the Black Report or couldn't recall why it was commissioned.

7% were coded this way (see also code (18)).

(iv) Code (4) 'To investigate the cancer clusters/To see if cancer clusters are linked to BNF'

77 people (17%) of the sample said this was the reason for the Report's commissioning. Indicates a factual reply, i.e.

1011B "It was commissioned to study the incidents of cancers in West Cumbria. (This is the only answer to this question and these are first words of report. Any other answers are wrong)" a UKAEA scientist and M. Institute of N Engineers.

(v) Code (5) 'To answer the allegations of the press/To see if their claims were true'

41 people or 9% felt this was the reason for the Report. As a result of the public controversy generated by the media.

In addition other codes were used for when more specific responses were given. i.e.

5A "To answer the allegations of the YTV programme" identified by 40 people.

and

5B "To answer the allegations of the Environmental Groups" used to code replies of 14 people.

(vi) Code (6) 'To reassure people that BNFL is safe'

This code was used for 19 people's comments or 4% of the sample. It was used to indicate comments that felt the report was to reassure people about BNF's activities or to place checks upon BNF. An example of the diversity of comments coded by code (6) are

1003A "Suppose it was too prove the validity of the ruling the factory made about the effluence backing up their statements. Was a third party really".

This comment indicates that Black was in complicity with BNF in some way! but less so than that suggested by code (19).

(vii) Code (7) 'To report on the November incident'

Used to code 39 comments - 9% - that mentioned the November 1983 incident, the beach incident, the discharge etc. This was an indication of what people thought the report's topic was.

(viii) Code (8) 'To find out who was responsible'

4 people under 1% (0.9) felt the Inquiry was to find out who, individually, was responsible for discharging the leak into the sea.

(ix) Code (9) 'To establish what radiation levels were experienced by the area'

2 people under 1% felt the commission was a general one in some way linked to the radiation in the area.

(x) Code (10) 'To identify what the health risks in the area were'

15 people (3%) felt the Inquiry was a general one into the health risks of the area with particular reference to BNF's activities.

(xi) Code (11) 'To answer the public's concern'

58 comments (13%) were coded in this way. Like Code (1) it is a more general code that relates to the controversy and public worry about many issues such as the discharges, the cancers for example. It is also similar to Code (5) in that the commission is seen as a response to publicise concern.

(xii) Code (12) 'The Government had no choice'

37 people or 8% felt the Government had no choice but to institute an Inquiry of some sorts into the events, the cancers etc.

(xiii) Code (13) 'Sir Douglas Black was to be an independent inspector/ An umpire/He is independent'

This code was used to code 36 people's responses (8%). It indicates that the respondent recognises Black as an independent, unbiased and fair auditor and investigator of the cancer clusters

(xiii)/continued

(or whatever the respondent thought he was investigating!).  
In this coding as far as is indicated the respondent believes Sir Douglas Black was impartial in his reporting and that there was no 'cover up'. See Code (14).

(xiv) Code (14) 'Black is biased/establishment'

This code was used to code 15 comments (3%) where people felt Sir Douglas Black was biased or too close to those he was investigating. Where a respondent felt the Inquiry was a 'whitewash' it was coded here.

(xv) Code (15) 'Hopefully Sir Douglas Black is unbiased'

3 people under 1% (0.7) felt that Sir Douglas was meant to be unbiased and impartial and the respondent hoped that was so. (This bears little relevance in my reading of the question as stated but response was made.)

(xvi) Code (16) 'To clear the air'

9 people (2%) felt the purpose of the Inquiry was to clear the air in the light of the controversy and acrimony over the previous months and years.

(xvii) Code (17) 'To help BNF counter the media and environmentalists' arguments'

17 people (4%) saw the Inquiry as a response to the criticisms of the Sellafield operation by the media and environmental groups. Undoubtedly some saw it as occurring at the instigation of BNF rather than the government or at the instigation of BNF in league with the government. In this response people felt the report would help BNF to counter the accusations of the media and environmental groups.

(xviii) Code (18) 'No idea'

40 people had no idea why the Inquiry and report were commissioned (9%).

(ixx) Code (19) 'To find out what action should be taken'

6 people's (1%) comments indicated that they felt the report was commissioned to make recommendations about whatever they felt the report was to investigate.

(xx) Code (20) 'To get it out of the limelight'

6 people (1%) felt the Inquiry was commissioned to take the events out of the public gaze for a while, in part, to prevent further publicity in the short term but also to supposedly give an informed verdict and findings.

(xxi) Code (21) 'GP's concern'

1 person felt the report was commissioned because of local GP's concern. To investigate and answer their queries.

In the course of the above procedure (and, formerly, in undertaking the survey on the ground) an air of wariness and uncertainty was apparent amongst respondents in answering this question. Partly a ploy to disguise their ignorance of the actual reasons it was commissioned when faced with an apparently 'factual' question, and therefore a desire not to be too certain in their replies which might be factually 'incorrect'. So, while the question was designed to elicit what people thought about why it was commissioned (and not to test their knowledge) the respondents seemed to want to hedge their comments between giving a factual answer and giving their actual feelings. 'Factually' more people should have answered that they were 'not sure'.

Appendix E    A selection of complete responses to the question:  
What did you think of the presentation and the  
findings of the Black Report?

1. Still think that things are being covered-up in the interests of BNFL.
2. As expected - reassuring exercise for the public.
3. Fair report - doesn't believe BNFL to blame for cancers.
4. An accurate report on what was found; findings would still have been reported had they been against BNFL.
5. Couldn't understand report: a lot remember leukaemia around here before Sellafield built.
6. No one knows everything: thought it a fair report.
7. Too technical: totally above my head.
8. I think it was OK and fairly done.
9. Enough to set my mind at rest and confirm my beliefs that no risks exist. But can't prove a negative - that it (cancer) isn't caused by effects of work done at Sellafield. Inconclusive. Hasn't shown why the incidences of cancer exist. Also shows no more risk living here than in other parts of country.
10. Thought they were confusing, it didn't state one way or another and helped no one by leaving it so undecided.
11. Very well done - but difficult for layperson to appreciate the findings.
12. Sounded fair and reasonable - left it open for more research - Made me think we need to know why there's the cancer or cancer in general not just associated with this area.
13. It's an inconclusive report I think they did their best with what they had.
14. Mixed feelings, covered some ground but left other areas open - as to causes of cancer in Seascale.
15. Not very clever; but thinks this will always be case when scientist presents to local public. As I expected.
16. Didn't understand it.
17. Much to be expected. Don't think findings are conclusive in any way.
18. Disappointed - it seemed to tell you so little, nothing was definite. It was not put over for the ordinary layman to understand. It seemed as if one statement contradicted another.

19. Can't remember much about it. Didn't expect any different, it would take an awful lot longer to prove or disprove the allegations from the programme.

20. It seems if interviewers were trying to do it down, as if they didn't like the findings. Thought it was too technical for average man in street. Basically agree for the moment with findings.

21. I felt it could have been put over better. Waited anxiously for findings to be published. Were as good as they could be in the time they had available. Reassured but I feel that a lot more investigation is needed to make me absolutely sure.

22. What he said is quite true, re-assuring and yet not a lot of people no wiser. Has come down in the middle - we're no further on.

23. What you'd expect on the whole far above the average person's comprehension. What I expected it to say.

24. Wasn't very confident about the way it was presented. Could only be obvious, in that whatever they found couldn't be too risky a disclosure.

25. For me fine. Re-assuring. I share the committee's view that more should be done to find out why there is a cluster in Seascale or anywhere else for that matter.

26. Pretty good. Can't really say what I think of it because figures can be manipulated - to say what you want them to.

27. Conclusive - means Sellafield not directly linked to the leukaemia victims at Seascale.

28. Don't think they can ever prove it until they know what causes the disease.

29. Didn't tell us enough.

30. I don't think it told us anything we didn't know.

31. Alright as far as it went - didn't prove anything either way. Nothing made more definite. The fact that they couldn't make connection with factory helped - it was something.

32. Wanted to believe his Report but I just couldn't let myself somehow..

33. Rather confusing. What I expected really.

34. Bit disappointed. Think he was vague, expected more of him. Think he was trying to re-assure people. There was not anything definite about it, it gave no answers.

35. I wasn't happy about him. I think he'd been bought. I wasn't happy with the findings either I thought it was just whitewash.

36. 'Slick'. Not impressed.

37. People in authority refuse to see anything wrong in it.
38. As expected of any first report or inquiry made in short time. Ain't complete yet. Just to put minds at ease, reassurance to local community and to general public.
39. Presentation was all right. Much as anyone thought. There would be a lot of people pinning hopes in it - disappointing in that way. Nothing said that hadn't already been said before.
40. Quite detailed but I don't think it did a lot for the local man in the street. I think it was a bit over our head. Satisfied with findings.
41. Pretty fair from what I've heard (only from media).
42. Quite satisfied with what was said.
43. Thought it was waste of money - poppycock, wasn't interested in findings.
44. Quite happy with them I suppose.
45. Seems to have presented the facts, I realise it's not the end of it all.
46. It is hard to judge.
47. Did no more than what YTV did - it highlighted one or two things. Constructive but limited in what it determined, because of lack of evidence. Did all it could do with what was available to it.
48. Nothing definite in it, not impressed with what I have heard.
49. Open ended - needs further investigation.
50. Couldn't care less.
51. From what I heard it was quite alarming - need comparisons.
52. Could have condensed it and sent to the whole of the local population.
53. Put in their own jargon. Have to believe the experts.
54. He's the man who knows, it's better than my layman's knowledge.
55. By the time these things report - they've forgotten what they've set out to do.
56. Know vaguely what it was. Nothing much has been publicised. Don't hear as much of that as the original shock horror story.
57. Style was a problem. What everybody thought they were going to find - nothing.
58. Too technical. Average person had no idea with it. Predictable.



59. Could have been more definite. Satisfactory.
60. There was nothing to find.
61. Wasn't worth having - a whitewash really. Didn't have the time to prove anything.
62. Didn't pay any attention to it really.
63. A bit baffling.
64. It proved we are at risk.
65. Fuzzy in places. I wasn't happy that it was wholly neutral.
66. Adequate. Nothing new was said.
67. In the circumstances, time limited, he did a good job. I'm still not happy about it. If there is a bigger risk of leukaemia in this area it might not be Windscale but whatever it is should be found out.
68. I was happy with presentation. Black Report put it well. Basic inconsistency between levels of radiation and what we know of causes of leukaemia. All he could do.
69. Very technical in a lot of aspects. Very good. Pleased that he didn't state a definite connection with the works and pleased that further research continues.
70. From all the things we know there's nothing to worry about. Very difficult to prove or disprove. It's like a court case. Black set up as a defence. Given a task with no conclusive answers. Was as accurate and meaningful as he could - no cause for concern.
71. Not clear enough - confusing - going round and round the subject. But best thing could do in the circumstances.
72. Accept everything Black said. Waiting for more work. Expected more investigations, never-ending. You can always carry on digging.
73. Black received well in the local area. Inconclusive - it needs another in depth inquiry. What was done was as much as possible - still left a doubt - we hoped there would be conclusive answer.
74. Not a lot, didn't have enough time - it hasn't made a difference to local attitudes.
75. Wasn't publicised enough to the rest of the country. People wouldn't have taken any notice - people still think there's something terribly wrong up here. Interesting because it more or less cleared us. They didn't definitely find a link between radiation and cancer.
76. Couldn't say. Absolute waste of time. Nothing will be done about it. We've had many reports. Mallory Report about Rugby - nothing has been done - there are still arguments. The powers that be should know that.

77. Black was nice enough man. Weren't much good - didn't fill me with confidence. And needs to be looked into further.. Didn't give a positive answer. Didn't say BNF is not responsible for these leukaemias. Not direct.

78. Black, steady, genuine approach - right man for the job. A lot of it was good information. But an air of doubt and started further studies, further research, started the ball rolling. Clusters in different parts of the country- wanted reasons for these - wanted more comparisons of environments.

79. Not readable, could have been clearer presentation - should have been summary report for local people. Lay people couldn't make much sense. Poor report, in the course of my work I read many reports, reviewed media statistics already available. NRPB work more thorough. I would have liked to identify common causes - did all the cases live on farms, near the sea, fathers who worked in the same building. Limited time but no headway.

80. They ought to have someone looking at it to see what facts are really true.

81. Taken no interest in what it was saying.

82. It answered all the questions for me.

83. Don't think he really settled it one way or the other - it still left you guessing.