Pergamon

0277-9536(95)00341-X

Soc. Sci. Med. Vol. 42, No. 5, pp. 759–768, 1996

0277-9536/96 $15.00 + 0.00

PUBLIC HEALTH RESEARCH AND LAY KNOWLEDGE

JENNIE POPAY and GARETH WILLIAMS

Public Health Research and Resource Centre and Institute for Social Research, University of Salford, Salford M5 4NY, England

Abstract—Social science research into the social patterning of health and illness is extensive. One important aspect of this has been work on lay knowledge about health and illness. In this paper we develop three main arguments. First, we suggest that recent developments in social science understanding of the nature and significance of lay knowledge should be more widely recognized within the social sciences themselves. Second, we argue that if public health research, whatever the disciplinary perspective, is to provide an understanding of contemporary health problems that is simultaneously more robust and more holistic, it must incorporate and develop the theoretical and conceptual insights offered by this recent work on lay knowledge and with lay people. Finally, we argue that in order to accomplish this it will be necessary to construct research questions in such a way that the conventional distinctions between science and non-science, and the methodological wrangles associated with this distinction, become marginal to the research process. This will inevitably involve conflicts between members of different professional groups. These conflicts provide the opportunity for open debate on the science and politics of public health research and represent a challenge for the many disciplines involved in this field.

Key words—lay knowledge, expert, social science, epidemiology, public health

INTRODUCTION

Out of the overlapping leaves of my brain came tapping...tapping...a voice that is not mine alone [1] (p. 123)

The growth of public health and the related research based discipline, epidemiology, were linked to the emergence of the 19th century social reform movements [2]. Developing in the face of the major health problems thrown up by the processes of urbanization and industrialization, public health began with a strong emphasis on social reform. However, the link between public health and social reform was transformed by the rise of bacteriology, with the work of Koch and Pasteur, in the late nineteenth century. This provided the biological foundation for the development of a 'new' epidemiology oriented to the control of specific diseases such as tuberculosis, diphtheria and syphilis. It also allowed medical science to dominate for the first time the 'untrained amateurs' in the field of public health, such as engineers, biologists and social scientists. In short, public health became medicalized [3].

It has been argued that this ascension of bio-scientific methods in public health was a mixed blessing. For all their explanatory power, they also moderated and sometimes replaced the political commitment to social improvements for the poor characteristic of early public health [4, 5]. Some commentators have suggested that medical public health focused downstream to such an extent that it lost sight of what was going on up the river [6]. More importantly from the perspective of this paper, public health research in general, and clinical epidemiology in particular, excluded from its microscopic attention the voices of the people who inhabited the "ruinous and filthy districts" within which the substances of bacteriology's interest were festering [7]. A limitation of public health research which, with a few notable exceptions, continues in our own time.

We are now faced with new times and new situations in public health research and practice [8]. Coronary heart disease, schizophrenia, rheumatoid arthritis, and HIV and AIDS have replaced cholera, polio, diphtheria and syphilis at the centre of public health's concerns [9, 10]. This has created an urgent need to think again about the nature of the connection between the social and biological dimensions of human health. These are also new times in politics and society [11, 12]. One aspect of these new times that commentators have discerned is an effect upon the way in which people understand the nature of scientific knowledge, the relationships between different scientific disciplines and between the knowledge of professional experts and of lay people. These trends should also herald new times for the scientific endeavour to understand the social patterning of health and illness.

The social patterning of health and illness—the way in which some groups or classes of people become ill and others remain healthy—is a subject that calls out for the imaginative use of many different disciplinary perspectives and methods in close collaboration with each other and with lay people. To date the study of the public health has been dominated by a science controlled (in varying degrees in different countries) by the medical

profession [4]. The epistemology of this science is based on the concept of disease as something that can be 'treated' objectively, separate from the individuals' experiences of the material reality of their everyday lives. In this sense 'biomedicine' has been a powerful tool, but one which has serious limitations in terms of our ability to grasp both the causes and the consequences of ill-health for individuals and societies.

There are many different dimensions to these limitations [13], but here we focus on one aspect which we believe to have profound implications. If research in the field of public health is to develop more robust and holistic explanations for patterns of health and illness in contemporary society, then it must utilize and build on lay knowledge—the meanings health, illness, disability, and risk have for people. There are no simple technical solutions to this challenge, though methodological developments will be necessary. It will also be important to question the epistemological basis for much research in the field of public health.

The potential contribution 'lay knowledge' can make to our understanding of patterns of health and illness are many and diverse and we discuss some of them further below. The pressure to move in this direction is raised by the severe limits attaching to the contemporary practice of much public health research. The power of modern epidemiology has rested upon its ability to deal with clinically defined disease entities with measurable probabilities attached to them; but modern health care systems are increasingly concerned with the burdens posed by chronic illness and disability, and with the problem of how to evaluate the effectiveness of interventions in terms of multi-dimensional outcomes, including the patient's own assessment [14]. Similarly, whilst research in the social sciences and humanities have given more attention to the meaning of health and illness in people's lives, much of this work is reluctant to embrace lay knowledge as a contributor to our understanding of the determinants of the public health.

In spite of a growing recognition of the practical limitations of biomedical public health, the epistemological assumptions underlying it are tenacious [15]. We discuss the consequences of this tenacity in terms of the marginalization of other forms of knowledge and, in the conclusion, we make the case for more systematic dialogue and reflexivity within scientific research, between researchers and policy makers, and between professional and lay experts.

THE PRIVILEGE OF EXPERIENCE: WHAT LAY KNOWLEDGE OFFERS PUBLIC HEALTH RESEARCH

The question of the meanings people attach to health and illness has emerged as an important theme within the social sciences and humanities in the last twenty years. However, the 'data' generated by this research is most commonly described as 'lay beliefs' and only recently, and painfully slowly, has it begun to be accorded the status of knowledge—and then only within the social sciences and humanities. For the rest it still remains largely marginal and often irrelevant to the research endeavour.

In contrast, it is a central contention of this paper that through a more or less systematic process whereby experience is checked against life events, circumstances and history, lay people acquire an 'expert' body of knowledge, different from but equal to that of professionals in the public health field. As Brown and Ferguson have recently argued regarding women's role in the environmental movement in the U.S.A.:

> women activists bring to their work the ability to transform their everyday experiences, mostly typically their own and their neighbour's children's illness, into knowledge which they can use in the struggle against toxic waste, and to insist on its validity as knowledge [16] (p. 5).

Lay expertise about health and illness has a vitally important role to play in public health research. Like professionals, lay experts may on occasions be 'wrong', but the validity and generalizability of the knowledge can be tested using recognized 'research' methods. On other occasions there will be no simple 'answer'—no right and wrong—and lay and professional knowledge will both have a contribution to make to understanding. Whilst lacking accreditation in any formal sense, lay experts can be accorded recognition on the basis of relevant extensive experience, much as are some senior academics, professionals and managers in the world of work [17].

Three dimensions of lay expert knowledge are particularly relevant to contemporary public health research and practice: lay understandings of the relationship between individual behaviour and life circumstances; lay theories about aetiology; and the predictive power of lay knowledge.

Agency and structure: creative human beings in a bind

A number of recent studies within British medical sociology serve to illustrate the way in which lay knowledge can enhance our understanding of the relationship between social circumstances and individual behaviour. These studies have sought to take account of the interaction between agency and structure; between the material, the social and the psychological. Recent work by Hilary Graham, for example, has explored smoking patterns and behaviours amongst women living in poor material circumstances in England [18, 19]. Using a combination of quantitative and qualitative methods her work has demonstrated how women living in difficult circumstances may consciously use cigarettes to cope with the stresses and strains of daily life. They do not lack knowledge about the health damaging potential of smoking. Rather,

> heavy smokers were caring for more children and for children in poorer health. They were more likely to be caring

alone and to be carrying extra responsibilities for the care of family members who needed help with health tasks...caring for more and living on less is part of the cluster of experiences that sustains smoking among working class women. Caring for more and living on less provides the context in which relatively few mothers attempt to give up smoking and few succeed [18] (p. 697).

In her earlier work Graham provided an opportunity for women to express their experiences in their own words and listened carefully to what they had to say. Subsequently, the insights gained were built into a large scale survey. In this way Graham and the women in her studies have switched a powerful spotlight onto the structural roots of individual 'health damaging' behaviour.

Another example of the complex nature of the relationships between lay knowledge, behaviour and health is found in work eliciting sensitive sexual information in the context of HIV and AIDS. The work by McKeganey and Barnard on prostitution and risks of HIV in Glasgow is a striking example [20–22]. These researchers used in-depth sociological research methods to explore the ways in which male and female prostitutes work, and their understanding of the risks to which they and their clients are potentially exposed. In contrast to traditional approaches to studying 'at risk' populations, this work attempted to develop an understanding of the local knowledge which informs the activities of prostitutes. They were able to show that the situations of male compared with female prostitutes, and drug using as compared with non-drug using prostitutes, are often quite different. In addition to providing useful ethnographic knowledge of a much discussed but little understood area of social life, this research was able to make recommendations for public health policy that were more realistic and less punitive than has traditionally been the case in anything to do with sexually transmitted disease.

Ways of knowing: lay theories of causation

Health professionals have long recognized that lay people have opinions about the causes of ill-health experienced by themselves or others. However, often these opinions are construed as interesting, but in some ways misguided, 'ways of knowing' about health and illness. Even within the social sciences, where much of the research into lay beliefs about health and illness has been undertaken, these beliefs are rarely presented as enhancing understanding about explanations for ill-health. Typically, they may be studied in their own right as cultural products [23] or considered important to the development of more effective health promotion policies—where they inform our understanding of the place of health and illness within the social and cultural orders of everyday life [24–26]. Alternatively, they may be studied as factors shaping the behaviours that individuals engage in when they are ill or in order to avoid illness [27].

Social research has explored the types of explanations for poor health offered by lay people. As several studies have demonstrated, there is a tendency for those living in the poorest material conditions and, potentially therefore experiencing the poorest health, to be more likely than relatively advantaged groups to blame poor health on individual behaviour [28–31]. As several commentators have argued this is a complex issue, linked in part to the research methods used, the nature of the questions being asked of respondents, and the relationship between health and morality within the Western world [29, 32].

What is important from the perspective of this paper is that to a large extent this body of social science research denies lay knowledge a place at the etiological table. Lay explanations are the object of research seeking to understand why people put forward different types of explanations rather than to inform understanding about the causes of ill-health. Additionally, as Blaxter [33] points out there have been few systematic attempts to link together epidemiological work on social inequalities in health and research into biographical lay perspectives on health and illness. This is curious because these approaches to research clearly have much to offer each other in enhancing the degree of generalizability and validity of findings from such studies, and in answering questions that one or other leaves in suspension [34]. There is good and growing evidence that professionals involved in public health research—whatever their discipline—ignore the etiological insights of lay experts at their peril.

Brown and colleagues, in the U.S.A., have highlighted the role of lay knowledge in understanding the causes of ill-health in their studies of community responses to environmental problems [35]. They have documented situations where lay people have identified a relationship between the experience of health problems in a local community and exposure to toxic wastes. In seeking to 'prove' their case these communities may have used traditional epidemiological methods, but the initial knowledge is experiential. Similar situations concerned with toxic waste have been documented in the U.K. [36].

Lay theories of causality are evident in other fields of public health. For example, local communities have attempted to highlight the relationship between the health problems they experience and exposure to pollution from nuclear installation and chemical processing plants, to damp and structurally unsafe housing, to industrial pollution and to high traffic densities [37, 38]. Workers have frequently been the first to identify causal relationships between their working environment and patterns of disease and the trade union movement has a long history of activism around health and safety issues [39, 40]. Similarly, the wives of victims of asbestosis, are reported as complaining to coroners courts that the deaths were due to exposure to something at work, long before

modern science studied the problem [41]. There are also many examples of patients identifying serious iatrogenic effects of drugs before professional experts—notably for example, women who linked the use of stolbesterol to prevent miscarriage early in their pregnancy to vaginal cancer in their teenage daughters [42].

These early warnings are often ignored or discounted by scientists. In many instances the relationships at the centre of these examples of 'popular epidemiology' remain contested by professional scientific experts, or denied. In the case of the Camelford incident in the U.K., where aluminium sulphate was accidentally tipped into a local water supply, for example, two 'expert' reports have concluded that the physical problems reported by local people were associated with "all the worry and concern" and that "the psychological harm could last a long time for some people" [43]. Similarly, the research on the relationship between damp and childhood illnesses challenged the professional view that parental smoking was the major risk factor, highlighting a dose response relationship between the prevalence of respiratory illness in children and exposure to damp in the home [37].

Alternatively the methodological difficulties of 'proving' the relationship of concern to lay people may be stressed by professional experts. For example, at a public meeting called to discuss the relationship between urban pollution and childhood asthma in the Docklands area of London the local Director of Public Health warned that it would be difficult and costly to prove the effects of pollution on health [44]. Long periods of time may pass during which no action will be taken or long legal battles may be waged. Meanwhile exposure continues, lay experts are ignored and lives may be unnecessarily lost or damaged.

Predicting the future

A third dimension of the potential contribution the expert knowledge of lay people may make to public health research is the growing evidence of its power to predict future health experience at the individual level. Research now commonly asks respondents for their subjective view about the state of their health at one point in time. The somewhat problematic relationship between responses to questions such as these, and more clinically based measures of health status, and measures of functional disability and chronic illness, have been the subject of considerable discussion [45–47]. Where subjective perceptions differ from those made on a more 'objective' basis—such as clinical examination, for example, or standardized measures—some would argue that the objective or medical assessment is in some essential way 'more accurate'. However, as Haberman has commented:

> At one time respondents' reports of illness were regarded as an imperfect but valid substitute for a medical report...The question of the validity of the reports evoked an awesome outpouring of research...basically, the answer is that respondents in surveys are poor substitutes for physicians (or vice versa) [48] (p. 343).

Clearly, important epistemological and phenomenological issues underlie the differences between lay and medical definitions of health and illness which merit the attention they receive. As Blaxter has argued, neither subjective nor objective accounts of health (and illness) are, alone, sufficient [30]. But one neglected possibility is that lay people's reports of generally poor health, in the absence of identifiable pathologies, or reported health problems, may be an early warning of serious problems to come. This is highlighted in longitudinal research which has found unexpectedly raised mortality rates amongst groups of people reporting generally poor health at an earlier point in time, who had no other identifiable health problems at that time [49, 50]. The nature of the relationship between mortality and subjective reports of health remains to be explored. It may well be that the causal route is linked to psychological rather than physiological processes or a mixture of both. Whatever the processes involved, however, the importance of taking these reports seriously within public health research as risk markers should be self-evident.

SYNTHESISING LAY AND PROFESSIONAL KNOWLEDGE: THE METHODOLOGICAL IMPLICATIONS

We have argued that public health research must incorporate and develop the conceptual and theoretical insights offered by lay experts on the nature and causes of contemporary patterns of health, illness and health related behaviour. The significance of lay knowledge has been established to some extent within the social sciences. However, as we have indicated above, there are important ways in which this knowledge is still given inferior status within the disciplines which make up these sciences. There has also been a reluctance to take lay knowledge into account within public health in general and epidemiology in particular. This is not surprising when one considers the profound methodological implications of doing so. To take lay knowledge seriously within public health research would undermine the dominance of quantitative and statistical methods, force serious consideration of the issues at the interface of qualitative and quantitative research methods, and most importantly, shift the ownership and control of the research process as a whole away from professional experts—whatever their discipline.

The need for methodological diversity

Through the 20th century, epidemiology and public health became part of a self-conscious scientific elite concerned with the practice of a biomedically dominated notion of scientific research.

In view of the enormous success of bacteriological epidemiology in isolating the causes of almost all bacterial diseases between 1873 and 1900 [51], this intellectual insouciance is understandable. However, as we have argued, it has made it difficult for epidemiology to adapt itself to the new challenges posed by chronic degenerative diseases linked to structurally shaped styles of life.

There are a wide range of methods developed by sociologists and anthropologists which are making an important contribution to enhancing our understanding of lay knowledge relevant to patterns of health and illness in the late 20th century. While much is made of the difference between qualitative and quantitative research it is difficult to draw a hard and fast distinction between the two. Moreover, people have sometimes seemed so obsessed with seeing the matter as one of either/or that it has led them to forget that the methods used should depend on the questions asked in response to a problem, not the other way around—a mistake that would not have been made by social reformers in the 19th century [52]. For example, quantitative research will tell you how many people smoke in your district, qualitative research will give you an understanding of why they continue to do so even though they know it is damaging their health. Quantitative research will tell you how many people suffer from chronic diseases and disabilities, qualitative research will tell you what it means to people to be disabled and the myriad interlinking ways in which it affects their daily lives. Quantitative research will tell you how many people in a locality 'need' different kinds of services; a qualitative approach will give you a sense of the range of health needs and the strength of feelings about different issues.

The key methods used in qualitative research—interviewing, observation, and documentary analysis—are equally familiar to researchers engaged in more quantitative research. What differs is the approach to the research subjects, the kinds of questions the researcher asks, and the criteria applied to assess the validity of the knowledge generated. While quantitative approaches emphasize standardization in data collection, and regard the randomized controlled trial as a gold standard, those engaged in using qualitative methods allow the nature of the questions they ask or the observations they make to vary from one setting to another [53]. For example, the power of much of the work undertaken on prostitution and risks of HIV transmission derives from the 'naturally occurring' situations in which the researchers were operating and their use of classical anthropological techniques in researching those situations [20, 21]. However, as in the public health research undertaken in the 19th century, this did not prevent them from counting things when and where they could.

Similarly, while interviews are much used within both quantitative and qualitative research, the way in which interviewing is undertaken and the kinds of questions asked will be different. In qualitative research, the interviewer seeks to understand the informant's world-view by raising topics of interest, but allowing the form the response takes to be determined by the respondent. The focus is not necessarily on the frequency with which things are said but rather with trying to get people to reflect on issues and to reveal as much as possible. The informal interview is therefore designed to explore themes and ideas. It is ideal for investigating the subtle, the complex and the controversial, as well as the unknown [54].

In some instances there will be a strong case for undertaking qualitative research as a complement to quantitative research. Qualitative information may, for example, illuminate confusing aspects of a numerical picture. In a health survey, for example, it is not uncommon to find that a significant proportion of people report a serious disabling condition yet report no contact with health services. To understand why this is the case and the extent to which it represents unmet need, qualitative research will be necessary. Qualitative research can also be used to add depth to the bare statistical bones of numerical information. Bringing findings to life in this way can often contribute to the more effective use of research within organizations. Different methods are needed to enrich each other—the substantive significance of statistical findings can be illuminated by qualitative findings. In short, we need to move away from rigid notions of scientific method to a concept of "appropriate methodologies" [55].

Combining methods: greater than the sum of the parts

As others have done, we are therefore arguing for a greater diversity of methods within public health research [56, 57]. However, whilst diversity of methods is necessary, it is not a sufficient condition for a revitalized public health research. Public health research must be about methodological synthesis and innovation as well as diversity. Only in this way will we 'make the most' of lay expertise. This means moving away from the traditional view of the qualitative study as a pilot before the real science and using research methods in an interactive way [58]. For example, Blane's work tracing the employment histories of workers to understand lifetime exposures to hazards, illustrates how qualitative research can inform the design of quantitative studies in ways which move beyond the simple formulation of questions [59].

Similarly, the work of Popay and Bartley [60] demonstrates how the cumulative findings of qualitative and quantitative research on domestic and paid work hazards can be combined to inform the development of standardized instruments for measuring labour conditions which take account of gender inequalities in the world of work. Measures such as these allow a direct comparison of women's and

men's experience of health and illness linked to work and can contribute to a greater understanding of the relationship between class and gender inequalities in health.

Sharing the power: participative research

Underlying these imbalances in method are inequalities in power. Notwithstanding the economic squeeze placed on big science as on other areas of the public sector in recent years, the physical or natural sciences have traditionally been regarded as elite occupations. Science is not something which anyone can do. In contrast to other areas of scholarly activity, such as the humanities, science, it is argued, is counter-intuitive and opposed to common-sense [61]. Those who form this elite are therefore engaged in forms of discourse and disciplines that lie outside the everyday discussions of public life.

However, public health is increasingly recognized as a multi-disciplinary activity. As the range of professionals involved in public health broadens, questions about the dominant role of the bio-medical perspective are increasingly being asked. Epidemiology may be important in public health, but so too are a variety of other skills [62]. This brings us back to the concept of appropriate methodologies and the recognition that appropriateness is not a judgement dependent upon professional expertise alone. Rather it depends also upon an understanding of local circumstances and knowledge and means making use of the local knowledge of researchers [63], and that of people themselves [64].

If public health research is to be more relevant and sound and lead to more appropriate and effective policy and practice, the lay experts have to be involved in the process: in generating the research questions, commenting on the research design, interpreting the findings, and developing the policy implications. If they are not then the potential inherent in the partnership between lay and professional experts will not be fulfilled. Even in situations where researchers get as far as acknowledging the importance of 'community perspectives' the conclusion may still be elitist, emphasizing, for example, that "...extensive personal communication and health education efforts by the health official or scientist should lessen the conceptual distance" [65].

Participative research means a continuous process of interaction and involvement between researchers and the lay people whose public health problems have become the objects of concern. As one social scientist has argued:

> If the commitment is to be made to empowering and strengthening community action, rhetoric is insufficient. Public health researchers must begin to devise methodologies and theories which allow for genuine participation in the research process, including the ways of handling the products of the research [66] (p. 9).

Such participation will challenge not only the way in which public health is practised but also assumptions about the proper relationship between public health knowledge and practice.

THE CONTESTED NATURE OF KNOWLEDGE

The issues we have reviewed suggest that if research is to enhance our understanding of the major public health problems of the next century, researchers—whatever their disciplines—will need to give more status to lay experts and begin to work together in a way rarely achieved within contemporary academic circles. There will be many intellectual, technical and organizational problems in the way of such developments, although it could be argued that the field of public health has already moved some distance from being a discipline-based activity to being a skill-based activity [67]. But perhaps the most significant barrier to change is a diverging view across the sciences about the nature of the knowledge they produce and the relatively different status afforded to different types of knowledge.

Epistemological assumptions in bio-medical science

For the most part, scientists working within fields dominated by the bio-medical perspective are not preoccupied by their epistemological assumptions and it is in the nature of "normal science" [68] that this should be so. They appear to be entirely pragmatic and, therefore, reasonable and fair—but only within limits. As a recent editorial in a leading medical journal puts it:

> Research on the health of populations is still dominated by experimental designs based on simplistic notions of causality that try to remove the variation and complexity of real-life health and disease processes [6] (p. 429).

While it is increasingly argued that social scientists should be pragmatic in their choice of methods, using whatever tools improve the work that they do [53, 55, 69], it is important to recognize that these choices about methods are very closely related to the 'deep structures' which inform the foundations of our science in the western world [70]. In spite of the pragmatic good sense of making public health research more plural in its methods and less elitist in its invitations to participate; and notwithstanding the hypostatization of the distinction between qualitative and quantitative methods, practitioners jealously guard their domains.

Science imposes definite constraints, in normal times, upon what methods scientists can use, what procedures they can adopt, how, when and where results are to be published. In other words there are definite assumptions, held by powerful people, about what is considered properly scientific. Scientists might claim that they are only involved in making sure that what attempts to pass itself off as science is not dictated by the sectional interests of particular scientists. However, as Habermas [71] has argued:

> Because science must secure the objectivity of its statements against the pressure and seduction of particular interests, it

deludes itself about the fundamental interests to which it owes not only its impetus but the *conditions of possible objectivity* themselves (emphasis in the original) (p. 311).

The critique of 'scientism'

The critique of western science developed by Habermas and other critical theorists is essentially a critique of ideology. That is, it is critical of the 'scientism' of science which attempts to give the impression that science is the only form of activity through which objective knowledge of the world can be developed. The problem lies in the belief that this logic should provide the criterion against which to assess the validity of all other knowledge. Popper [72] put forward the commitment to falsification or refutation, as the key difference between science and non-science—a position supported by others [61]. This weighed very much in favour of those forms of knowledge generated from highly controlled settings. The influence of Popper has fostered deductive thinking within epidemiology. But it has also inhibited the methodological pluralism and critical openness which research requires to deal with the problems confronting the public health [73, 74].

It is this kind of epistemological hegemony against which critical theory reacted, seeing it as something which had implications beyond science itself. It not only discounted certain forms of knowledge from taking part in scientific discussion, it also disempowered groups of people working outside the dominant paradigm from making any contribution to debate over the policies which science could inform [75]. It also provided the impetus for Feyerabend's attempt to outline an 'anarchistic theory of knowledge' where he argued that: "All methodologies have their limitations and the only "rule" that survives is "anything goes"" [76].

The dissatisfaction of critical theory with the purely logical demarcation of science from non-science has provided the foundation for a much stronger critique of the 'rationality' of science from within the social sciences. Different sciences and approaches to science have, to use Habermas' terms, different 'knowledge-guiding interests' [71]. These knowledge-guiding interests provide the conditions of possible objectivity within the framework of particular disciplines and forms of scientific and scholarly research.

Successful science, far from conforming to Merton's norms of universality, communality, disinterestedness and scepticism [77], is based on the persistent lobbying of governmental representatives and mobilizing a variety of other social groups in support of the scientists' interests, including 'the public'. As a recent commentary on science policy in the U.S.A. concluded: "Science does not have an inherent entitlement to funding but it should try harder to get the public on its side" [78]. You cannot study the context of science out of relation to its content, or *vice versa*. As Bartley has argued, following Latour: [79] "If we separate the inside and outside of science...we will be unable to understand the processes involved. Science must be studied in the context of the issue communities in which it is embedded" [80].

Devaluing women's knowledge

We have noted many reasons why the knowledge lay experts bring with them is ignored or discounted in research into the causes of contemporary health problems. A final important factor worthy of mention is the prominent role of women as informal guardians of the public health. Women's role in this regard has been widely documented within the family, within the informal care sector, and within the world of paid health work [81–83]. Their position within the environmental movement has recently been discussed by Brown and Ferguson [16].

The fact that it is women who are often at the heart of lay action for health further re-enforces the tendency for professional scientists to discount lay knowledge. As Brown and Ferguson argue, the validity of the knowledge of women involved in toxic waste activism:

> ...is contested by scientific experts and professionals, whose cultural beliefs about women and science lead them to refuse to accept the women activists' claims about the consequences of toxic waste [16] (p. 5).

CONCLUSIONS

Work on the philosophy and sociology of science and the contested nature of knowledge does not provide an immediate justification for looking at lay knowledge as an important component of public health research. However, it does provide a vital context for the sorts of concerns we have raised in this paper. Certainly the plea that we be more pluralistic in our methodology (if not anarchistic in our epistemology) fits well with the shift within the policy world towards the view that consumers of public services have a greater say in the quality and nature of provision [84, 85]. It is also in tune with the movement of people demanding not only a say in decisions on the siting of toxic industries and material (such as nuclear dumps) but also a voice in the discussion over the evidence and theories for and against the likely health effects of such decisions. Moreover, the notion that science is part of an issue community in the same way as are more overtly partisan groupings is an important advance on the belief that science is in some sense privileged and untainted by worldly concerns.

Those engaged in particular areas of research inevitably become preoccupied with the methodological rules of the activities which bind them day after day. They are also working to the increasingly tight timetables imposed by external funding bodies who are in turn working in relation to the policy

framework of government. This is itself wedded to a set of economic and political interests dictated by business or the State. In this context, the possibilities of conversations with 'amateurs' or outsiders are not top of the list of things to do. However, the consequences of such intellectual reclusiveness are profound.

In terms of the research itself it can lead to a situation in which researchers are asking the same questions over and over again. For example, in relation to inequalities in health it has been argued that researchers have become overconcentrated upon its amount to the neglect of its distribution and nature [33]. Their detailed empirical enquiries have become so abstracted that they have lost the ability to talk the languages of experience and politics through which their knowledge and the implications of that knowledge for action can be shared. Any dissent becomes reduced to argument over methodological details rather than the nature of the questions being asked.

We are not arguing that 'professional expertise' is to be devalued. But we are suggesting that there is a need to develop a much more reflexive understanding of the ways in which expertise—whether professional or lay—is structured. There is also a need for a more egalitarian perspective on the contribution that different forms of knowledge can make to our understanding, and the policies which could flow from it. The 'borderland' between 'science' and 'opinion', where many public health problems lie, is an important test-bed for the viability of this kind of democratic or public science [86].

It is often argued that this kind of relativism, central to the sociology of knowledge since Mannheim [87], leads to a post-modern maelstrom of populism or perspectivism. If all accounts are equally valid, who do we believe and where do we go? However, such a prospect is highly unlikely. In Mannheim's terms, it is not a question of objectivity and subjectivity, it is rather that most knowledge is *relational* rather than *universal*. Its statements and propositions are meaningful or not in relation to the social and historical context within which the actor is located [88].

For many of those involved in public health research, there remains something called 'science' which has a variety of forms but whose practitioners share a fundamental belief in the dichotomous separation of science from non-science or 'common-sense' [61]. Within this dichotomy science is equated with reason and moderation, non-science with irrationality and fanaticism. This dichotomy is often supported by the editors of newspapers who in other contexts would regard themselves as being liberal and pluralistic. For example, in the context of recent debates in the U.K. over the science and ethics of medical intervention in fertility, an editorial in *The Guardian* [89] argued:

> The rise of anti-scientists has to be resisted. They have a long and dismal history, but each era breeds a virulent new group...Far from recognising the scientific method as one of the glories of civilization, they seek to denigrate it...the scientists have to keep the public on board—and the anti-scientists at bay.

There is little sign here of an open debate over different points of view. The 'virulent' anti-scientists, and rigid ideas about 'the scientific method' and 'the public', suggest an inability to grapple with the new pluralism required to deal with many of our public health problems. Indeed, this reaction to other voices may represent one of the limitations of traditional liberalism. If a "...truly liberal *society* is characterised by diverse ways of life...[and]...a truly liberal *state* cherishes and gives public recognition to this diversity" [90], then a truly liberal science will be open to a range of theories and methods and develop ways to debate the assumptions and implications of these.

The forms of lay knowledge that we have described are highly critical and sceptical of science. They represent more than disagreements over matters of detail. In a sense they are forms of dissent because they question the given rules set by those in positions of power [91]. Are they, too, pursuing a 'triumphalist New Ignorance'? Or do they provide an opportunity for 'scientific rationality' to be opened up to wider public debate? In public health research there is a need to 'de-centre' methodology, and to recognize that in responding to the problems we face we '...should appreciate the insights of any methodology that can make a positive contribution' [92]. Intellectual tensions between disciplines should provide the basis for invigorating debate rather than mutual hostility [93]. This debate will need to take place in public spheres with many voices competing for attention. The challenge for all the disciplines involved in public health research is to create contexts and develop methods of research that allow these shared perspectives, this heterodoxy, to be brought into public discussion, even (or especially) if they act to disturb the peace.

We have argued that recently emerging research into the nature and significance of lay knowledge has much to offer those researchers interested in the public health. However, these insights bring with them major challenges for professional scientists, at the level of concepts, theories and methods. The status of lay expertise about health and illness within social science research varies enormously, as it does amongst the wider health research and practitioner community. In an important sense, it is incumbent upon those involved in public health research to rescue this body of knowledge from "the enormous condescension of posterity" [94].

At the risk of sounding old-fashioned we might say that science is a search for truths rather than a particular set of methods [95]. However, this search will require a greater humility on the part of all the professions involved in the public health endeavour;

a willingness to work alongside lay expertise in defining and researching problems; and a mutual respect and patience as we learn each others languages. To advance such a process it will be necessary to develop research processes and use research methods—both quantitative and qualitative—which make lay expertise and its potential visible.

REFERENCES

1. Gilmore M. *A World Away. A Memoir of Mervyn Peake*. New England Library, United Kingdom, 1971.
2. Webster C. *The Victorian Public Health Legacy: A Challenge to the Future*. The Public Health Alliance, Birmingham, 1990.
3. Acheson R. The medicalization of public health: the United Kingdom and the United States contrasted. *J. publ. hlth Med.* **12,** 31, 1990.
4. Fee E. and Porter D. Public health, preventive medicine and professionalization. In *Medicine in Society: Historical Essays* (Edited by Wear A.). Cambridge University Press, Cambridge, 1992.
5. Armstrong D. Public health spaces and the fabrication of identity. *Sociology* **27,** 393, 1993.
6. *The Lancet*. Population health looking upstream (Editorial). *The Lancet* **343,** 429, 1994.
7. Engels F. *The Condition of the Working Class in England: from Personal Observation and Authentic Sources*, p. 94. Panther, London, 1969.
8. Ashton J. and Seymour H. *The New Public Health*. Open University Press, Milton Keynes, 1988.
9. Etheridge E. *Sentinel for Health: a History of the Centers for Disease Control*. University of California Press, California, 1992
10. *The Lancet*. Rise and fall of diseases. *The Lancet* **341,** 151, 1993.
11. Friedman J. The past in the future: history and the politics of identity. *Am. Anthrop.* **94,** 837, 1992.
12. Flacks R. The party's over—so what is to be done? *Soc. Res.* **60,** 445, 1993.
13. Dean K., Kreiner S. and McQueen D. Researching population health: new directions. *Population Health Research: Linking Theory and Methods* (Edited by Dean K.). Sage Publications, London, 1993.
14. Fitzpatrick R. Health needs assessment, chronic illness and the social sciences. In *Researching the People's Health* (Edited by Popay J. and Williams G.), pp. 183–200. Routledge, London, 1994.
15. Gordon D. Tenacious assumptions in western medicine. In *Biomedicine Examined* (Edited by Lock M. and Gordon D.). Dordrecht, Netherlands, 1988.
16. Brown P. and Ferguson F. Making a big stink: Women's work, women's relationships and toxic waste activism. Paper presented to the *Annual Meeting of the American Sociological Association*. Pittsburgh, Pennsylvannia, 1992.
17. Williams G. and Popay P. Lay knowledge and the privilege of experience. In *Challenging Medicine* (Edited by Gabe J., Kelleher D. and Williams G.). Routledge, London, 1994.
18. Graham H. Women's smoking and family health. *Soc. Sci. Med.* **25,** 47, 1987.
19. Graham H. Gender and class as dimensions of smoking behaviour. *Soc. Sci. Med.* **38,** 691, 1994.
20. McKeganey N., Barnard M. and Bloor M. A comparison of HIV-related risk behaviour and risk reduction between female streetworking prostitutes and male rent boys in Glasgow. *Sociol. Hlth Illness* **12,** 274, 1990.
21. McKeganey N. and Barnard M. *AIDS Drugs and Sexual Risk: Lives in the Balance*. Open University Press, Buckingham, 1992.
22. Barnard M. Violence and vulnerability: conditions of work for streetworking prostitutes. *Sociol. Hlth Illness* **15,** 683, 1993.
23. Helman C. Feed a cold, starve a fever. *Culture, Med. Society* **2,** 107, 1978.
24. Cornwell J. *Hard Earned Lives: Accounts of Health and Illness from East London*. Tavistock Publications, London, 1984.
25. Davison C. Davey-Smith G. and Frankel S. Lay epidemiology and the prevention paradox: the implications of coronary candidacy for health education. *Sociol. Hlth Illness* **13,** 1, 1991.
26. Blaxter M. The causes of disease: women talking. *Soc. Sci. Med.* **17,** 59, 1983.
27. Rosenstock I. M. The health belief model and preventative behaviour. *Hlth Educ. Monographs* **2,** 354, 1974.
28. Calnan M. *Health and Illness: the Lay Perspective*. Tavistock Publications, London, 1987.
29. Blaxter M. Why do the victims blame themselves? In *Worlds of Illness: Biographical and Cultural Perspectives on Health and Disease* (Edited by Radley A.). Routledge, London, 1993.
30. Blaxter M. *Health and Lifestyles*. Tavistock/Routledge, London, 1990.
31. Pill R. and Stott N. C. Prevention procedures and practices among working class women: new data and fresh insights. *Soc. Sci. Med.* **21,** 975, 1985.
32. Turner B. *The Body and Society*. Blackwell, Oxford, 1984.
33. Blaxter M. Inequality and the problem of time. *Med. Sociol. News* **18,** 12, 1992.
34. Ferrarotti F. Biography and the social sciences. *Soc. Res.* 57, 1983.
35. Brown P. Popular epidemiology and toxic waste contamination. *J. Hlth soc. Behav.* **33,** 267, 1992.
36. Williams G. and Popay J. Researching the people's health: dilemmas and opportunities for social scientists. In *Researching the People's Health* (Edited by Popay J. and Williams G.). Routledge, London, 1994.
37. Platt S. D., Martin C. J., Hunt S. M. and Lewis C. W. Damp housing, mould growth and symptomatic health state. *Br. Med. J.* **298,** 1673, 1989.
38. Phillimore P. and Moffatt S. Discounted knowledge: local experience, environmental pollution and health. In *Researching the People's Health* (Edited by Popay J. and Williams G.). Routledge, London, 1994.
39. Frumkin H. and Kantrowitz W. Cancer clusters in the work place: an approach to investigation. *J. Occup. Med.* **29,** 949, 1987.
40. Watterson A. Occupational health in the UK gas industry. In *Locating Health. Sociological and Historical Explorations* (Edited by Platt S., Thomas H., Scott S. and Williams G.). Avebury, Aldershot, 1993.
41. Roberts H. Taking risks. *Med. Sociol. News* **19,** 17, 1993.
42. Ulfelder H. The Stolbesterol disorders in historical perspective. *Cancer* **45,** 3008, 1980.
43. Department of Health. *Water Pollution at Lowermoor, North Cornwall: Second Report of the Lowermoor Incident Health Advisory Group* (Chair: Dame Barbara Clayton). HMSO, London, 1991.
44. *The Guardian*. Dusting down to fight in Docklands. *The Guardian* September 11, 21, 1991.
45. Blaxter M. and Patterson E. Mothers and daughters: a three generational study of health attitudes and behaviour. *SSRC/DHSS Studies in Deprivation and Disadvantage*, p. 5. Heinemann Educational Books, London, 1982.
46. Blaxter M. A comparison of measures of morbidity. In

Health Inequalities in European Countries (Edited by Fox J.). Gower Press, Aldershot, 1989.
47. Blaxter M. Self definitions of health status and consulting rates in primary care. *Q. J. Soc. affairs* **1,** 133, 1985.
48. Haberman P. W. The reliability and validity of the data. In *Poverty and Health* (Edited by Kosa J., Antonovsky A. and Zola I.). Harvard University Press, Cambridge, 1969.
49. Kaplan G. A. and Kotler R. L. Self reports: predictive of mortality. *J. chron. Dis.* **38,** 195, 1985.
50. Cox P. *et al.* Paper presented to the Society for Social Medicine Paper, England, 1993.
51. Weindling P. From infectious to chronic diseases: changing patterns of sickness in the nineteenth and twentieth centuries. In *Medicine in Society: Historical Essays* (Edited by Wear A.), pp. 303–316. Cambridge University Press, Cambridge, 1992.
52. Yeo E. Mayhew as a social investigator. In *The Unknown Mayhew: Selections from the Morning Chronicle*, 1849–50 (Edited by Thompson E. P. and Yeo E.), pp. 56–109. Penguin, Harmondsworth, 1973.
53. Silverman D. *Qualitative Methodology and Sociology*. Gower, Aldershot, 1985.
54. Silverman D. *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction*. Sage, London, 1983.
55. McKinlay J. The promotion of health through planned socio-political change: challenges for research and policy. *Soc. Sci. Med.* **36,** 109, 1993.
56. Black N. Why we need qualitative research. *J. Epidemiol. Commun. Hlth* **48,** 425, 1994.
57. Baum F. Researching public health: behind the qualitative–quantitative methodological debate. *Soc. Sci. Med.* **40,** 459, 1995.
58. Marsh C. *Exploring Data: An Introduction to Data Analysis for Social Scientists*, 2nd Edn. Polity, Cambridge, 1992.
59. Blane D. 1993 Paper presented to the *Nuffield Conference on the New Social Epidemiology*, June, Leeds.
60. Popay J. and Bartley M. Conditions of formal and domestic labour: towards an integrated framework for the analysis of gender and social class inequalities in health. In *Locating Health: Sociological and Historical Explorations* (Edited by Platt S., Thomas H., Scott S. and Williams G.). Avebury, Aldershot, 1993.
61. Wolpert L. *The Unnatural Nature of Science*. Faber and Faber, London, 1992.
62. Aldersdale R. and Hunter D. Forward march. *Hlth Service J.* **19 March,** 22, 1992.
63. Del Vecchio Good M-J. Local knowledge: research capacity building in international health. *Soc. Sci. Med.* **35,** 1359, 1992.
64. Rice C., Roberts H., Smith S. J. and Bryce C. It's like teaching your child to swim in a pool full of alligators: lay voices and professional research on child accidents. In *Researching the People's Health* (Edited by Popay J. and Williams G.). Routledge, London, 1994.
65. Graber D. and Aldrich T. Working with community organisations to evaluate potential disease clusters. *Soc. Sci. Med.* **37,** 1079, 1993.
66. Kelly M. The role of research in the new public health. *Critical publ. Hlth* **3,** 4, 1990.
67. Turner B. The interdisciplinary curriculum: from social medicine to postmodernism. *Sociol. Hlth Illness* **12,** 1, 1990.
68. Kuhn T. *The Structure of Scientific Revolutions*, 2nd edn. University of Chicago Press, London, 1970.
69. Hammersley M. *What's Wrong with Ethnography?* Routledge, London, 1992.
70. Gouldner A. *For Sociology*. Penguin, Harmondsworth, 1973.
71. Habermas J. *Knowledge and Human Interests*, 2nd edn, p. 311. Heinemann, London, 1978.
72. Popper K. *Objective Knowledge*. The Clarendon Press, Oxford, 1972.
73. Pearce N. and Crawford-Brown D. Critical discussion in epidemiology: problems with the Popperian approach. *J. clin. Epidemiol.* **42,** 177, 1989.
74. Burrage H. Epidemiology and community health: a strained connection? *Soc. Sci. Med.* **25,** 895, 1987.
75. Habermas J. *Toward a Rational Society*. Heinemann, London, 1971.
76. Feyerabend P. *Against Method: Outline of an Anarchistic Theory of Knowledge*, p. 296. Verso, London, 1978.
77. Merton R. *The Sociology of Science*. Chicago, Chicago University Press, 1973.
78. *The Lancet*. US science policy: what science, whose policy? *The Lancet* **343,** 367, 1994.
79. Latour B. *Science in Action*. Open University Press, Milton Keynes, 1987.
80. Bartley M. Do we need a strong programme in medical sociology? *Sociol. Hlth Illness* **12,** 371, 1990.
81. Graham H. *Hardship and Health in Women's Lives*. Harvester/Wheatsheaf, Brighton, 1993.
82. Finch J. and Groves C. (Eds) *A Labour of Love*. Routledge and Keegan Paul, London, 1983.
83. Leeson J. and Gray J. *Women and Medicine*. Tavistock, London, 1978.
84. National Health Service Management Executive, 1992. *Local Voices. The Views of Local People in Purchasing for Health*. Leeds, U.K.
85. Seale C. The consumer voice. In *Dilemmas in Health Care* (Edited by Davey B. and Popay J.). Open University Press, Milton Keynes, 1993.
86. Beck U. *Risk Society: Towards a New Modernity*. Sage, London, 1992.
87. Mannheim K. *Ideology and Utopia*. Routledge and Kegan Paul, London, 1936.
88. Bourdieu P. 'Vive la crise! For heterodoxy in social science'. *Theory and Society* **17,** 773, 1988.
89. *The Guardian*. Applying the science for a fertile debate (Editorial). *The Guardian* 8 August, 1993.
90. Parekh B. Superior people: the narrowness of liberalism from Mill to Rawls. *The Times Literary Supplement*, 4743 (February 25), 13, 1994.
91. Rosen M. and Widgery D. (Eds) *The Chatto Book of Dissent*. Chatto and Windus, London, 1991.
92. Wolfe A. Weak sociology/strong sociologists: consequences and contradictions of a field in turmoil. *Soc. Res.* **59,** 758, 1992.
93. Jefferys M. Medical sociology and public health: interdisciplinary relationships 1950–90. *Publ. Hlth* **105,** 15, 1991.
94. Thompson E. P. *The Making of the English Working Class*, p. 13. Penguin, Harmondsworth, 1968.
95. *The Guardian*. Social science comes out fighting (Editorial). *The Guardian* 21 August, 14, 1990.