INTRODUCTION

During the last couple of years, a group at the Liverpool School of Tropical Medicine (LSTM) have been working together to develop a set of guidelines to assist in Gender Analysis in Health. Members of the gender group come from a range of disciplinary backgrounds, covering the biomedical and the social, and our highly fruitful interdisciplinary work has brought into focus what I see to be crucial issues regarding directions for gender and health – namely, the ways in which gender analysis concentrates largely upon socio-economic aspects of health, and leaves to one side the effects of the ways in which the foundational disciplines of the life sciences and biomedicine are themselves gendered. Yet these are the effects that touch directly upon the work of institutions such as the LSTM – and more broadly, upon international approaches to health and to “disease control”.

The LSTM works, on the whole, from within the paradigms of bioscience and biomedicine, staffed predominantly by parasitologists, entomologists, molecular biologists and clinicians.

1. Guidelines for the Analysis of Gender and Health (Jan 1999) are available from Rachel Tolhurst, IHD, Liverpool School of Tropical Medicine, Pembroke Place, Liverpool L3 5QA, England; e-mail: r.j.tolhurst@liverpool.ac.uk.
Traditionally it has had a focus on disease rather than on health, and on individuals rather than on the social conditions leading to health and illness, operating within what the School historian, Helen Power, has termed “the false geography of colonial science” (1999:239), a geography bound up with the colonial history of Britain. As with similar Tropical Institutes/Schools of Medicine scattered across the cities of Europe in countries that were previously colonial powers, its origins lie in the extension of colonial rule across the countries of Africa, Asia and Latin America. Colonialism, particularly in the early days, was primarily a masculine endeavour—a field in which soldiers, adventurers and civil servants held pre-eminent sway. And where men ventured forth to conquer, govern and administer, male medics and scientists followed in their wake. They went not only to care for the health of their fellow colonists but also to investigate the wide range of new scientific phenomena and diseases opened up to them by these “new” worlds. These countries came to be encompassed in the phrase the Tropics, a term that, whilst referring to a geographical area, became redolent of jungles, heat, swamps and fever, of uncharted land to be discovered and mapped (Anderson 1992). Whilst attempting to move forward from this masculine dominated and exotically constituted colonial history, the discipline of tropical medicine continues, to some extent, to treat diseases as though a primary characteristic is their location in particular geographical or climactic situations, to the detriment of any politico-economic understanding of their distribution, transmission and impact.

The growing focus in international health on the influence of power inequities and poverty has, however, stimulated the integra-

2. In contrast, many of the initiatives in health and medical care for local populations were undertaken by women. Whilst the colonial state generally neglected the health needs of the population (Arnold 1988), women physicians took up their concerns, and particularly those of women and children, with apparent enthusiasm. Further, for women physicians, countries such as India offered a working experience unavailable in Europe, where male physicians attempted to exclude women from practice.
tion of a strand of thinking, a counter discourse, that is focused not upon disease entities per se but upon the socio-economic conditions of health, illness and health care. This is an approach that is more in tune with Gender Analysis in Health as it is widely understood. But the integration of the social with the medical is taking place in such a way that, whilst the cultural, political and economic conditions of health and disease are opened up to gender analysis, the theories and even some of the practices of the disciplines of biomedicine and of the life sciences continue to be seen as the arbiters of an objective truth, untroubled by the effects of gender.

**Origins of Biomedicine**

It is this notion that biomedicine can provide us with an objective truth about health and illness that I want to question, drawing upon examples of how gender impacts upon thinking about so-called “tropical diseases”, and upon how gender interweaves with questions of race and class to construct particular ways of looking at bodies and diseases. To do so, I want first to make a digression into the past, to look at the histories of our current models of biomedicine, for I believe these histories speak powerfully to how we think and act in the present. The development of western biomedicine as we know it today dates back to the European Enlightenment era (16/17th century) when notions of objective empirical science began to replace superstition and religion as ways of explaining both the natural world and the social order. Science, and biomedicine in particular, were characterised as masculine undertakings, a part of the process of advancing culture through developing a clearer understanding of the workings of the “natural world”. Scientific prowess was itself viewed as a male gift and the subject of investigation, Nature, was held to be related to the feminine, often identified as woman, to be unveiled, unclothed and penetrated by masculine science (Jordanova, 1980). Such Western gendered notions of nature and culture were integral to the practice of science and medicine, always already present in its foundational
ideass. Despite its adherence to rationality and objectivity, and its belief in the possibility of “pure knowledge”, untouched by the means of its production, science was, from its modern inception, constructed in its beliefs and practices through gendered processes.

GENDERING BIOLOGY?

THE FIXITY OF BIOLOGY

The life sciences and medicine developed during the European enlightenment era, through empirical studies of the body. Biology was (and continues to be) seen as a natural given, something that just is, whose workings can be revealed to us by science. In these terms, sex, the biological distinction between male and female, is simply a natural, taken for granted fact, a pre-given category, not open to question or interpretation. We are all familiar, for example, with the oft repeated claim that women have a longer life expectancy because of their “natural” biological advantage over men. And as Krieger and Fee suggest, “It seems so routine, so normal, to view the health of women and men as fundamentally different, to consider the root of this difference to be biological sex” (1994:266).

3. My aim here is not to set up simple binaries – of culture, the rational mind and masculinity as positive notions to be set in opposition to nature, the instinctual body and femininity. For these oppositions were never simple, and there was never a universal gendering of minds and bodies, of science and nature as respectively masculine and feminine. The point rather is that these ideas influence and are influenced by the structuring of the socio-cultural world, and that while there may appear to be dominant discourses – as biomedicine has been dominant within European approaches to health – there are always alternative and resistant ways of seeing, of representation, of acting, both within and outside such dominant models. Counterdiscourses offer us competing constructions of materiality, of health and illness, of our bodies and minds and their relationship to each other – and they have material effects.
Gender is seen as overlaying this biological base, as involving culture and society, not foundational biology. Thus for a gendered analysis of different experiences of health and illness we might, for example, look at inequities in access to services, or at unequal life chances which means young girls receive less education, less food, less care than young boys. Yet the notion that our ways of living and being and understanding are formed by the societies within which we live stops at the body’s surface. What lies outside the body is socio-cultural and open to interpretation and change – but what lies hidden within the body is taken as a universal truth. The body is the pure, uncontaminated ground upon which scientists and medics can operate, fixed and unchanging through time and space.

Most of the gender and health analyses found in the literature unquestioningly reproduce this standard division between sex and gender that separates the biological from the socio-economic. At times, gender analysts appear to maintain the fixity of biology far more vehemently than many current day bioscientists would be prepared to do. Working as they are, with a direct awareness of the mutability and variation in the bodies with which they deal, many bioscientists, whilst recognising bodily limits and boundaries, would themselves be wary of ideas of fixity.

**Biology as Transformable**

A more nuanced view of biology maintains that, in contrast to this fixed relationship between sex and gender, our lived, sexed bodies are transformable, that they are shaped by and contingent upon both material and social forces, of which gender is clearly one dimension. The way my body is marked as female, living as I do within the socio-cultural context of Liverpool, England, with access to a car, and running water, and health services is very different from the way in which, say, a north Indian woman’s body

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4. In producing the Gender and Health Analysis Guidelines, we conducted a wide literature review, drawing on both published and grey literature in gender and health. Without exception, they all adopted a clear sex/gender split.
may bear the marks of her sex, if she headloads 20 kilos of wood daily, cooks within a smoky hut and has limited access to health care. We both carry the physical and material signs of our being female, of our sex – but the gender/class relations of our contexts mark our bodies in very different ways.

Whilst this approach recognises the body as a dynamic object, changing through different social and environmental pressures, it continues to define it as essentially predetermined, existing prior to and separately from the social sphere. Within gender analysis, we see this separation in diagrams such as that offered by Rathgeber and Vlassoff (1993), which provides a detailed and useful breakdown of socio-economic influences on gender and tropical diseases. Composed of a number of interlocking circles, the largest right-hand circle is headed Gender Variables and lists factors that fall into the categories of Economic/productive activities, Social/reproductive activities and Personal factors. This detailed circle is interlinked with two circles containing the terms Prevention, and Nature of Treatment, and these are in turn linked to an otherwise empty cross-hatched circle labelled Disease. The circles for disease and for the practices of biomedicine, prevention and treatment, are empty of detail, connected in an undetermined way to social processes. What we see in this socio-economic model is a reversal of the usual biomedical web of disease causation in which the role of genetics, hormones and infective agents are stressed at the expense of the social.

Whilst a small number of models more expressly include biology as the dynamic ground upon which other social forces act, the dynamic assumed is usually that of the inter-relation of a limited and closed system, the body, with an infinitely diverse social environment. These linkages between broad social processes and biology have been a consistently underdeveloped feature of social models of health, and an understanding of how the one affects the other is only just beginning to be teased out. Nancy Krieger suggests that epidemiology still lacks a theoretical framework that truly integrates social and biological understandings of health, disease
and well-being, what she would call an “ecosocial” epidemiological theory. She advocates the development of a theory that “embraces population-level thinking and rejects the underlying assumptions of biomedical individualism without discarding biology” (1994:896).

Further, biology usually serves as the ground upon which other explanations are laid, diagrammatically represented as a layer that exists before numbering starts. It is thus pre-social, the first cause answer.

I would like to emphasise that the approaches to gender analysis I have mentioned above have provided us with valuable insights into the complex interaction of socio-economic factors that influence health. But whilst holding onto biology, as Krieger suggests, may push us to start to explore how the body’s biology is capable of affecting the way a disease manifests and the frequency and severity of its consequences, the questions of how we investigate these relationships and how we describe these processes are often left unchallenged. Within medical research for example double blind placebo controlled trials continue to be taken as the gold standard for producing “valid” research findings and such results are held up as descriptions of material, objective and scientifically verified truths. Biological investigations of disease-causing organisms, their life-cycles and their development within the human body follow a similar pattern, searching for isolatable factors that can be assigned particular roles or effects. There is no questioning of what is focused on, what is silenced, what is recorded, what is ignored within this complex interplay of the embodied subject and her environment.

Whilst it has long been argued that some of the practices of science and medicine can be understood as gendered activities (seen, most simply, in the gendered divisions of doctors and nurses roles and power relations), other practices, in particular laboratory based experiments continue to be defended as objective and value-free, as though they can be conceived and conducted in a manner totally untouched by the disruptive influences of gender. A growing literature critiques such reductionist approaches in biomedical and life
sciences research, whereby the biological body is isolated and separated from its socio-economic environment. As I have said, there is thus a whole area – the most fundamental part of biomedical practice, that involved with understanding and explaining the internal processes of bodies and of biology – that is held to operate to a series of neutral rules that are applicable universally, independent of the social context.

**Biology as gendered**

However, my concern here is not so much with the specifics of experimental and research practices, but rather with the ways in which the theories and language of the disciplines of science and medicine are held to exist outside the social, untouched by and shielded from relations of power: neutral, objective, they are arbiters of “the truth” about the body and about disease. This view of biology and medical theory as outside of relations of power, of their conceptual underpinnings and knowledge claims as value-free, presents a fundamental problem for integrating gender into health in any just or ethical way, obscuring questions of agency and denying history. It has major consequences both for how we understand biology, physiology and the bodily processes of health and illness, and for how we understand the ethical relationships between health workers and clients, and between people and their environments.

In contrast, I would want to argue that the idea of “pure objectivity” which grounds scientific thinking and practice is already compromised, not in that it is contaminated by controllable external effects but rather in that our ways of seeing, believing and understanding can never stand separately, outside of culture. In arguing that biology is gendered, I am not trying to deny the existence of a material flesh and blood body that can be empirically measured and assessed, diagnosed as having, for example, malaria or HIV or malnutrition. The point rather is that bodies and diseases are understood, explained and classified through language – and that language itself is a cultural form with a past, a history, a social context. What appear to be objectively observable facts are both the objects
and the effects of particular socio-political contexts. From this perspective, sex cannot exist prior to gender. Rather, sex emerges as a category of analysis through the ways in which gender operates.

For concrete examples of this we could look at the ways in which notions of race and sex became concretised as biological “truths” over the last 400 years. In Renaissance anatomy texts of the 16th century, we are offered representations of the human body such as the penile vagina – at first glance male, but in actual fact, a representation of the female sexual anatomy (see Laqueur 1990). The Renaissance anatomists worked within a discourse that held there were two genders, masculine and feminine, who fulfilled different social roles, but only one sex. This sex developed male or female characteristics through the presence or absence of heat in the body (Laqueur 1990). It was not that the Renaissance scholars were bad anatomists or unobservant. Rather, what they saw, how and where their attention was directed led to anatomical drawings that represented the truth of their age – two genders, one sex.

By the 18th century, biology and gender had come more clearly into line with each other, and increasingly, the body’s organs and structures were held to determine our social ways of being. Londa Schiebinger, in her book “Nature’s Body” (1993) offers us a detailed historical description of how categories of sex – and race – came to be fixed in a biological hierarchy during the 18th century, through a detailed examination, for race characteristics, of male bodies, those of European, African and Asian men and of male orangutans, and for sex characteristics, of European bodies, male and female. She suggests that whilst part of the explanation for which bodies scientists chose to examine lay within the politics of their own scientific communities, there were other, deeper factors which focused their gaze in particular directions. These were the questions of slavery, colonialism and women’s rights.

The 18th century was a time of major political upheaval with, for example, the French Revolution offering abstract promises to its citizens of freedom and equality. But such promises were part of a public struggle for power and representation which concerned pri-
marily men and European women, free peoples of colour and slaves struggled to challenge the limitations put on these questions of rights and equality. Contemporary anatomists of the day analysed sexual and racial characteristics according to a hierarchy of being which placed white European men at the apex. Schiebinger argues that, "increasingly, questions of ethics (particularly those regarding equality) were taken to stand or fall on the findings of anatomists" (1993:172). Soemerring, one of the great anatomists of the late 18th century "expressed a belief that anatomists did not have to take a moral or political stand because the body spoke for itself" (Schiebinger 1993:173 – my italics). Again, what they saw reflected the political and cultural truths of their age.

More recently, in the 19th and early 20th centuries, the developing field of "tropical medicine" had a major impact upon ways in which health in the countries of Africa, Asia and Latin America was understood – and in how they were marked by gender and race. Whilst I don't have space to go into the effects of this in detail here, it is clear that much of the early research was conducted only on men looking, for example, at how white men survived under "tropical conditions", in comparison to men indigenous to these countries. Unusually, a study in the Philippines did include ten nuns. Perhaps, as sisters of charity they somehow didn't count as real women! Much of the research was based upon a desire to demonstrate the superiority of the Caucasian temperament and physiology, whether evinced as greater resistance or increased sensitivity to particular climactic conditions (Anderson 1992). In such studies, as in the examples given by Schiebinger above, men were both the norm, the yardstick against which others were measured, and, in the case of white men, the ideal to be struggled for. Women's bodies would simply have confused the purity of the research results.

Now these debates about the gendering of biology may be interesting in theory and in a historical sense – but what implications do they have in the here and now, and in our daily practice? What I'd like to do now is pick up on a series of issues, looking at current
examples of and implications for the gendering of biology and biomedical theory.

**WHAT DO WE SEE?**

I want to start at the very simplest level – by looking at the ways we describe what we see down our microscopes, the place from which much biological knowledge is held to originate, using two examples from the field of malaria studies. Malaria is caused by a protozoa, a Plasmodium, which reproduces by what have been termed “sexual” and “asexual” means, following a life cycle that was first mapped out at the end of the nineteenth century in the days of light microscopy. Contemporary descriptions of the sexual stage offer us a story of romance and sexual conquest, based upon the meeting of the female and male gametes. As the story opens in the mosquito’s stomach, one text tells us, “the female ... now a mature gamete, awaits the arrival of a male” (Kreier and Baker 1987:165). Whilst she quietly anticipates the arrival of her suitor, another text takes up the tale of “the development of the liberated male gamete”. He “becomes very active” (K&B), and produces flagellae (string-like structures) which “lash about and then break free” (Strickland 1984:523), to “seek out”, “penetrate and fertilize” the female gamete (K&B). This description of an active all-conquering super-hero male gamete tallies very closely with that analysed by Emily Martin in her discussion of scientific accounts of human biology. She describes how “the picture of egg and sperm drawn in popular as well as scientific accounts of reproductive biology relies on stereotypes central to our cultural definitions of male and female” (1991:1-2).

But this gendering process does not only apply to mechanisms identified in the days of light microscopy. A recent text on the genetics of malaria provides us with a picture of one of the crucial segments of a chromosome. At either side are areas identified as being the “transcriptionally active antigen-encoding domain” whilst in the centre is an undifferentiated mass of “housekeeping genes”,
whose purpose is to do with maintaining the interior environment of the cell – the genetic equivalent of organising the dusting, ironing and vacuuming (Feagin & Lanzer 1996).

I’d like to highlight just two implications of this gendering of biological descriptions. Firstly, in how it influences where we direct our attention and what we value. Bonnie Spanier argues that there is a hierarchy in how genes are described and analysed, with a higher value conferred on those genes that exert control over the development and expression of other genes as compared to those genes that code for enzymes running the cell’s metabolism, the “housekeeping genes”. These latter mirror a female domestic workforce that tidies up but whose precise role is not described, counted or valued. They are regarded as “a routinized and less significant kind of gene” (Spanier 1995: 87). Whilst this may not seem to be enormously significant in itself, a gaze directed at one set of genes may miss crucial roles or linkages in other aspects of genetic biology that could have a major impact on research developments:5

Secondly and more broadly, what gendered language in biology implicitly reinforces is stereotypical views of women’s and men’s relations. The female gametes and genes are described as less active, less involved, less influential. Such gendered hierarchies of description of biological processes have a wider significance in relation to the development of disciplines. For example, in some aspects of molecular biology the focus on control genes is part of a move to find a genetic explanation for “life” itself (Spanier 1995). Regular news reports inform us of the latest gene “discovery” – for alcoholism, violence, homosexuality, feminine behaviour. This sociobiological perspective runs counter to recent moves against a reductionist view of biological organisms, and itself reinforces sexist notions of pre-determined biological roles, of male control and female caring. As Emily Martin says, “the stereotypes imply not only that female biological processes are less worthy than their male counterparts but also that women are less worthy than men” (1991:483-4).

We can see some of these patterns of gendered understanding played out in practical terms in relation to research into HIV/AIDS. Whilst the situation in relation to the development of knowledge about HIV/AIDS is complicated, with differing epidemiological patterns in the USA/Europe and in Africa for example, what is clear is that much of the early knowledge of illness was based upon the effects of infection upon men. Clinical definitions were drawn up in relation to the symptoms men experienced, thus excluding a wide range of symptoms, gynaecological and other, unique to women. Women were diagnosed later because their symptoms were not recognised, there was little knowledge about how disease progressed in women, and drug trials excluded women on the basis of pregnancy (Gilks et al 1998). The cumulative effects of such developments and gaps in knowledge is to reinforce the perspective that the normative forms of health/disease are always already men’s, whilst women’s health is Other, and has to be labelled specifically as such. Such othering goes hand in hand with a lack of attention to diversity, resulting in delays in mapping the differing patterns of illness and sets of symptoms not only between women and men but, in this case, between HIV/AIDS in USA/Europe and in Africa, a crucial omission, intercut as the experiences of HIV are by questions of race and sexuality and economic situation.

**WHAT DO WE SAY?**

What the above analysis has explored is how gender in health, illness and biology works at the levels both of what we learn to see, and of how we describe things. Whilst there have been some recent moves towards more inclusive language in medical writing, our libraries are still full of books and journals in which the female is always marked as the other, not the norm and in which usage of the term “man” is indicative of both the male sex and of all humankind, producing a confusing minefield for the gender sensitive reader.

6. See, for example, Moore & Clarke 1995 on depictions of male and female bodies in contemporary anatomy texts
For example, on onchocerciasis, the Short Textbook of Preventive Medicine in the Tropics informs us “in most endemic areas, infection is maintained by man-to-man transmission”, and “man is the only reservoir of infection”. But, confusingly, “males are infected more frequently than females” (Lucas and Gilles 1980:204). To undo the specific use of “male” from the normative and universalising use of “man”, to work out that there are not some helminth infections that have a particular predilection for testosterone and homoerotic bonding, whilst turning tail at the slightest whisper of an oestrogen molecule, requires the alert reader to challenge the privileged and unmarked use of masculine terms in biomedical description. The failure here is not simply that of viewing man as the norm. More, it is the failure to recognise the diversity of what “becoming” a woman or a man may entail, within the embodied and multiple dynamics of race, class, disability, age and other power structures that influence health.

Now one response to the gendered gaze and to naming processes would be to attempt to use gender neutral language. Although it might be nice to feel we could get rid of some of the most stereotyped representations, it seems to me that this is an approach that misunderstands the nature of language and of power. It fails to acknowledge that we describe our material world in language whose purpose is to represent. Language is not the thing itself, but a cultural form for transferring meaning - and meanings carry the weight of context, of history, of power. They serve a purpose. They constitute our understanding of our worlds. And further, these meanings are not fixed – a point which probably became extremely obvious in a conference such as “Tant qu’on a la santé?”, where this paper was first presented. We were working in at least three languages, people were translating for their colleagues – and I know that what I said had differing meanings for many persons to those which I intended. My response to this problem of translation is not to attempt to control meaning, to constrain and limit it, for meaning cannot be fixed and held down in this way.7

7. I came across such an approach in a gender and health workshop when we were discussing the problems posed by the differing political understandings
It seems to me the challenge of meaning is to interrogate it, to work to continually uncover more of its connections and relations, its dynamics of power, to understand how it helps to practically and materially shape our worlds - and to work out how we can intervene in this process to support knowledges and practices that enhance agency and equity. If as Donna Haraway has said, one of the tasks for a feminist analysis of science is “to construct the analytical languages ... for representing and intervening in our ..., worlds” (1997:62), it is vital that we recognise that naming is a political act, and that our words, however scientific and rational they may aim to be, are never innocent.

Whilst the analysis I have presented argues that there are no universal truths, no ultimate solutions, no clear and universally agreed goals at the end of “scientific progress”, it does not remove our responsibility to act, albeit within the context of partial and situated knowledges. There is no escape from power within the health field, and the processes of gendering are part of this operation of power. We are engaged with this power - and our actions can demonstrate solidarity with those who face inequality and oppression - or serve to reinforce unequal operations of power. Biomedicine is a highly gendered force-field whose operations and concepts we ignore to our peril.

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7. applied to the term gender. One major international organisation had developed a definition - and I was told that when they talk about gender in the organisation, this definition is the one they all use - implicitly, that they all have the same understanding of gender. Clearly, they don’t and they can’t.
BIBLIOGRAPHY


