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OF WAR, MEDICINE AND MODERNITY: INTRODUCTION

Roger Cooter and Steve Sturdy

Historians have paid remarkably little attention to the relationship between war, medicine and modernity. This is surprising in view of the efforts that have been devoted to exploring two of the three sides of the triangle – the connections between war and modernity and between medicine and war. Thus we have a wealth of studies which argue that war is a crucible of modernity, or at the very least that it epitomizes the social forms and forces that are seen to constitute modern society. Likewise, the relationship between war and the development of medicine has been subject to increasingly detailed, though often less critical, historical analysis. By contrast, few studies have sought to examine the place of medicine in the constitution of modernity. This volume aims to advance all three areas of scholarship by looking explicitly at the relationship between war, medicine and modernity.

To begin with, however, it is necessary to define what we mean by 'modernity'. The word has been variously interpreted, but our usage follows that originally set out by Max Weber. Writing in the years around the First World War, Weber identified a constellation of social processes and forms that he saw crystallizing about him. These included the growth, differentiation and integration of bureaucracy and other organizational and managerial systems; the standardization and routinization of administrative action; and the employment of experts to define and order such systems. Unification and uniformity, Weber perceived, were fundamental aspects of 'rational' as opposed to 'traditional' society. Whereas 'traditional' social systems operated through diverse forms of social interaction and bonding, 'rational' ones aspired to conformity through the imposition of bureaucratic planning and administration. Underlying this, as indicated by Weber's designation of such a society as 'rational', was a form of calculative and evaluative thought that both legitimized and advanced the extension of bureaucratic structures into ever more intimate areas of social life.¹ Weber also appreciated that an important expression of this rationality was the development and application of scientific and technical productions which further transformed older social legitimations and ways of knowing.² Many subsequent writers have taken this constellation of social and intellectual forms and processes as characteristic of 'modernity'.³

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An: Geschichte
Betreff: WG: Of War, Medicine and Modernity

1. 24

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Weber did not approve of this modernity. Technical means of calculation of every sort contributed to the 'disenchantment' of his world.⁴ He loathed the stranglehold of bureaucracy that he saw all around him before his death in Germany in 1920: 'This passion for bureaucracy', he wrote, 'is enough to drive one to despair. It is as if in politics . . . we were deliberately to become men who need "order" and nothing but order.'⁵ Yet he also appreciated that this 'passion' was not all-pervasive. Whatever the tendencies towards the imposition of bureaucratic and rational order on human life, such ordering remained imperfect and partial, confounded by the local contingencies of social existence. For Weber, 'rational' society was only one of a number of *ideal* types of social organization – the others being 'traditional' and 'charismatic' – that could be seen by the sociological eye to be operating in the world of his time. 'Rational' society – comprising the social forms that we take to be distinctive of modernity – is thus an analytic and heuristic category. It provides a way of talking in generalized terms about certain kinds of social structures and tendencies that might be seen to characterize a particular historical age or a particular society; but it should not be supposed that such structures or tendencies have ever defined a society in its entirety. It is in this spirit that this volume draws on Weber's insights to talk about the relationship between war, medicine and modernity.

WAR AND MODERNITY

Modern war is often regarded as central to the Weberian notion of modernity. Indeed Weber himself recognized that the characteristics of bureaucracy were epitomized in the army: concentration of administration in the hands of masters; tight hierarchy and strict subordination; the pursuit of technical mastery, speed, precision, unambiguity, discretion, secrecy; and above all, 'discharge of business according to *calculable rules* and "without regard of persons"'.⁶ Modern wars are 'total wars', involving the mobilization of all the resources of a society for war-like purposes, including those of science, medicine and technology. To accomplish their ends, they necessarily entail massive bureaucratization and teams of expert managers. They thus exemplify administrative ways of knowing and acting. As such, while the slaughter of war has ever been rationalized, it might be said of modern wars that they epitomize the rationalization of slaughter.⁷

The material and intellectual origins of this linkage between war and modernity can be traced at least as far back as the late seventeenth century when England began her emergence as the first modern fiscal-military state – a state wherein war and increased taxation demanded a highly developed government bureaucracy.⁸ More commonly, however, such origins are sought in France in the Revolutionary and Napoleonic Wars (1792–1815) with their integration of military and civilian enterprise through the mobilization of 'citizen armies'.

Although recent studies have called into question the extent of this popular support and participation, there is no doubt that even before Napoleon's takeover, the French state underwent a process of bureaucratic militarization.⁹ New levels of control and compulsion were introduced into everyday life, and local customs and practices were replaced by centralization and uniformity in the pursuit of primarily military goals. New forms of industrial production were also pursued, most notably in the arsenals of Paris. As early as 1785 Thomas Jefferson marvelled at the production of standardized interchangeable gun parts in the workshop of Honoré Blanc, while in 1792 Goethe witnessed the triumph of such methods when the artillery of the Revolutionary army routed the advancing Prussians. It was, Goethe declared, 'the beginning of a new epoch'.¹⁰

Most historians tend to trace the links between modernity and war to the American Civil War of 1861–5, however, and more especially the Franco-Prussian War of 1870–1 – though in these instances modernity is often equated simply with industrialization. The American Civil War was remarkable not only for its use of railways, steamships, early machine-guns and so on, but also for its mass mobilization of 'citizen soldiers' and its routinization and standardization of managerial procedures and technologies. The latter included techniques for gathering and abstracting information about populations in general, and about the bodies of soldiers in particular – techniques of surveillance and regulation which aimed at greater control and efficiency of military manpower. The Franco-Prussian War carried these developments further, rendering the organization of war comparable to that of the 'scientifically managed' factory, or, as Daniel Pick has provocatively suggested, to the systematization of slaughter and butchery that took place in the new Parisian abattoirs of the 1860s.¹¹ As in the rationalized slaughterhouse, geared as it was to maximum production and profit, so in warfare: specialized divisions of labour, uniformity, centralized inspection and work discipline became the hallmarks of a new and more systematic organization of concerted human endeavour. The waging of war and the killing of enemy soldiers had become an efficiency driven mechanized industrial process, perhaps best symbolized in and realized through the new technology of the machine-gun.¹²

At the same time, the differences between civil and military spheres were becoming increasingly blurred, both in practice and in ideology. Like the late Victorian city with its expanding system of integrated public utilities, the field of battle was now networked by railways, telegraphic lines of communication and specialized and coordinated emergency services. The same kinds of rationalization deemed necessary for the conduct of large-scale business, philanthropy and industry were seen to be essential for the efficient operation of mass armies. Both the military and the civilian spheres were reorganized and disciplined in accordance with the same notions of socio-economic efficiency.¹³ Weber was inclined to see such processes as originating in the military itself, declaring that 'The discipline of the army gives birth to all discipline'.¹⁴ Others,

like the French poet and philosopher Paul Valéry, regarded the military command structure as the epitome and 'ideal' of modern socio-economic organization.¹⁵ Karl Marx saw modern warfare as the perfect confirmation of his theory of capital: 'Is there anywhere', he asked Engels during the American Civil War, 'where our theory that the *organization of labour is determined by the means of production* is more brilliantly confirmed than in the manslaughter industry?'¹⁶

The First and Second World Wars vastly extended the forms and processes of modernity: the size of bureaucracies, the numbers of managers, the extent of the integration of civilian and military spheres, as well as the scale and sophistication of the mass manufacture of armaments and the routinized treatment of their effects on human bodies. The waging of war was thoroughly industrialized, as human life and labour were increasingly subordinated to the imperatives of mechanical and other technologies. During the First World War, the troops – widely beheld as 'poor cogs in the pitiless, devastating machine of war',¹⁷ or like automata as in Wyndham Lewis's 1918 painting of *Officers and Signallers* – went to the front in shifts, engulfed as they themselves perceived in 'the industrialism of war'.¹⁸ Their war was not one of 'politics by other means', as Clausewitz would have it, but of industry under a different name. At the same time, industrial production itself came to be seen as a way of pursuing international competition – a form of war by other means. Industrialization and militarization were both shaped to the same ends of conflict between nations.

It is therefore hardly surprising that the blurring of boundaries between civil and military concerns can be seen particularly clearly in the political impetus towards the organization of welfare states. By the dawn of the twentieth century, virtually all industrialized nations were expanding the scope of public (though not necessarily statutory) welfare activity in the simultaneous pursuit of both economic and military advantage. In the modern world, the welfare and the warfare state increasingly become indistinguishable from one another.¹⁹

Before leaving our survey of the relationship between war and modernity, it is worth mentioning one other body of scholarly writings besides that inspired by Weber. A number of authors have documented the influence of war on the emergence of 'modernist' aesthetics, discerning in the music of Stravinsky, the paintings of Munch and the Dadaists, and the poetry of Sassoon, Brook and Eliot, the intellectual impulses behind the 'birth of the modern'. In the literary and cultural histories of Modris Eksteins, Samuel Hynes and Paul Fussell, for example, 'modernism' – understood to be 'the principal urge of our time'²⁰ – is born as the First World War severs the cord between present and past 'beliefs, values and imagination',²¹ and finds its voice in the articulation of a uniquely 'modern memory' that has no knowledge of events before the carnage of Flanders.²²

Although some authors within this tradition, for instance Daniel Pick, challenge the decisiveness of the First World War in the making of the modern,²³ there is a marked tendency among the analysts of modernism to hypostasize and

concretize cultural and intellectual idealizations. In Eksteins's work, for example, the First World War is portrayed as a clash of cultures symbolized by the principal opponents – Britain standing for old and stable forms of common culture, while Germany becomes the bearer of a modern sensibility characterized by a preoccupation with speed, newness, transience and psychological interiority. Such work also tends to dwell upon tensions and contradictions supposedly inherent within the intellectual and affective framework of modernism; a case in point is the literary critic Elaine Showalter, who shows how the contradictory polarities of gender were problematized by the unprecedented experiences of the First World War.²⁴ More problematically, this genre of cultural history is pervasively haunted by an awareness of what is commonly taken to be the ultimate expression of the contradictions of modern 'rational' society, namely the Holocaust. But while such writing frequently draws directly on sociological studies of the Holocaust – now routinely represented as 'industrial killing'²⁵ – it is generally far more inclined to deal with the psychological than the sociological, and with the representational than the political.

At its best, this literature locates new psychologies of remembering and identity within the shared social experience of war, and within the new forms of communal life and culture that came out of it.²⁶ But at its worst, the critical analysis of modernist mentalities operates in a sphere quite unconnected with the historical and sociological examination of modernity itself. Most writing on the culture of modernism signally fails to engage with Weber. Few contributors to this genre have noticed Weber's disdain for the 'rage of order' and the expansion of military and civil discipline,²⁷ let alone asked what all this might mean for the discipline of sociology that Weber inspired.²⁸ 'Modernity' itself is rarely questioned; often it is assumed to be historically and sociologically unproblematic – a culturally and politically undifferentiated phase of cultural evolution, or even a material force equivalent to 'industrialization' or to war itself. As Ulrich Beck has remarked, even contemporary sociologists are often content to use the word 'modernity' unthinkingly, in a spirit of 'haplessness' born of academic exhaustion, disciplinary collapse, or loss of political appetite for the old frameworks of social analysis.²⁹ Seen from this perspective, modernity – and modernism – becomes little more than a prelude to the invention of post-modernity, while sociological and historical investigation is reduced to the distinctly subordinate role of providing 'ammunition for Theory'.³⁰

On the whole, then, the literature on modernism and war tells us rather more about the concerns of some late twentieth-century scholars than about the social and political history of the relations between war and modernity. Above all, this literature should not be mistaken for an account of war and modernity; at best, it may provide insights that sociologists and historians can pursue through more concrete and contextually located studies. Modernity does not reside solely in the literary expressions of a few gifted individuals, nor

in the tensions and contradictions between different sets of social assumptions and experiences. While contradiction and ambiguity are often the stuff of literature, individuals habitually move between different and often inconsistent social institutions with unthinking ease. Rather, what distinguishes modernity in the Weberian sense – including modern warfare – is the tendency for ever larger spheres of social life and institutions to be brought under a unified and coherent system of rationalization and administration. It is in the concrete realities of social life that we must look for any satisfactory account of war and modernity.

WAR AND MEDICINE

If the relationship between war and modernity has been subjected to at least a measure of thoughtful and theoretically sophisticated sociological and historical analysis, the same cannot be said of the interactions between war and medicine. Though there exists an abundant literature on medicine in wartime, such writing pays little attention to the wider context in which war was waged, or to the role of war in the making of modern society. Indeed, until very recently, this literature has been overwhelmingly dominated by practitioner-centred accounts of how medicine has benefited from and been advanced by war. Such triumphalist reckonings are as implicitly militarist as they are naively positivist and partial.³¹

Of course, some medical practitioners, specialisms, research programmes and commercial concerns have done rather well from war. So too have certain patient populations, notably those whose military, industrial or reproductive fitness has been seen as crucial for the conduct of warfare, and whose health has accordingly attracted the intervention of the state and other national bodies.³² But it is equally the case that many aspects of medical welfare have suffered as a result of wartime reallocations of material and human resources. Weak, vulnerable and unproductive groups such as the aged and the mentally and physically handicapped have usually seen a deterioration in medical and other welfare provision. While it is widely recognized that research into preventive and therapeutic medicine has often intensified during wartime, little has been written on how the direction of such research was determined by the particular agendas of warfighting, or how other potentially valuable lines of investigation were marginalized and neglected. On the whole, pressing questions about the impact of war on the aims, concerns and social configurations of medicine have been ignored in favour of simple and self-serving narratives of technical and organizational advancement.

Moreover, work in the 'war-is-good-for-medicine' tradition has generally overlooked the experiences of the vast majority of practitioners during wartime – experiences that ranged from boredom and frustration with administrative red

tape, to horror at the attitudes of brutality and barbarity that many medical men donned with their uniforms and officers' stripes.³³ Although only a minority of practitioners and biomedical researchers have ever pursued human experimentation with the same enthusiasm as some Nazi and Japanese doctors during the Second World War,³⁴ few ambitious and enterprising physicians and surgeons have been able to resist the research opportunities afforded by the mobilization of large numbers of medical 'subjects' under the authoritarian conditions of war. This temptation is hardly new; as early as 1587, Barnaby Rich's *Pathway to Military Practice* advised surgeons to 'worke according to arte, not practisinge newe experiments upon a poore souldier'.³⁵ What is new about modern warfare is the sheer scale of such mobilization, and the extent and scope of the machinery for ensuring subjection to military and medical controls. Again, little has been done to ask how the experiences of war may have contributed to a dehumanization of medicine, not just among the demonized losers, but also among the victorious, whose wartime activities have largely been obscured behind a veil of moral rectitude.

If there is a need for a more critical history of war and medicine, we should not be content simply to aim at a more balanced account of the relative benefits and hindrances that might have accrued to medical practice and provision during wartime. Rather, we need to be aware of, and to work around, a pervasive assumption that limits the conclusions drawn by most writers in this field, namely the supposition that war is no more than an 'aberrant disaster' that disrupts but does not substantially influence the normal course of social and cultural life.³⁶ Invariably, existing accounts fail to perceive both war and medicine in terms of wider sociocultural, economic and medico-professional contexts that transcend the social boundaries of military life and the temporal boundaries of wartime itself. As suggested above, it is one of the defining characteristics of modern war that it helps to break down the distinctions between civilian and military spheres. With the emergence of the modern nation state, it has become increasingly difficult to distinguish between the pursuit of national interests by peaceful and by warlike means. As Richard Titmuss observed in the aftermath of the Second World War, we must consciously abandon the assumption that 'war is an abnormal situation, [and] that peace is – or ought to be – the normal lot of mankind'.³⁷ War, in other words, is not separate or distinct from the constitution and processes of the society in which it is practised,³⁸ any more than is medicine.³⁹

Consequently, it is not enough to ask simply whether war is good or bad for medicine. What is needed is an account of the relationship between war and medicine that is sensitive to the role of both in society more generally. For one thing, we need to understand the reciprocal processes of the civilianization of medicine in war and its militarization during peacetime.⁴⁰ But this can hardly be enough. If the story of war and medicine is to be recounted in any satisfactory

way, it must be in the light of a proper analysis of the relationship between medicine and modernity, which will complement the accounts we already have of the relationship between modernity and war.

MEDICINE AND MODERNITY

In surveying past work on the history of medicine, one is immediately struck by the absence of a historical literature that focuses on medicine and modernity. Curiously, while historians have written about many aspects of modern medicine – its therapeutic shifts, politics, culture, economics, ethical problems, and so on – none have attempted to set it in the framework of any generalized understanding of modernity, Weberian or otherwise. Typically, a recent volume of historical essays with 'medicine and modernity' in the title nevertheless fails to make any explicit mention of the concept.⁴¹ The nearest we get to any such analysis is a handful of studies which incorporate specific aspects of medicine into broadly sociocultural and intellectual histories of modernity. A fine example is Anson Rabinbach's history of the transformation of medical and managerial perceptions of labour in Europe between the mid-nineteenth and mid-twentieth centuries. Subtitled 'The Origins of Modernity', Rabinbach's study examines the work of psychologists and physiologists who redefined the human body as a 'human motor' capable of generating measurable and regulable amounts of physical and mental work.⁴²

Another example of this type of partial engagement with medicine is Wolfgang Schivelbusch's history of the coming of the railway – one of the most vivid symbols of modernity, and a powerful stimulus to medical debate over the effects of modern life on the human organism.⁴³ Railway accidents, or simply the unprecedented speed and physical jarring of train travel, were commonly identified as the precipitating causes of a condition known as 'railway spine'. This condition in turn figures prominently in one of the few literatures to engage explicitly with medicine and modernity, that on the history of psychology and psychiatry.⁴⁴ This psychological literature is also the only one that seeks to address the relationship between medicine and war in the larger context of the development of modernity, chiefly through its analysis of shell-shock.⁴⁵ A word of caution is in order, however: with its concentration on psychology and on subjective sensibilities, historical writing about shell-shock often has more in common with literary analysis of modernism as opposed to any properly historical or sociological investigation of modernity.

Admittedly, some sociologists of medicine bring aspects of modernity into their purview. This is especially the case among those who follow Foucault in showing how medical views of the body serve the aims of social surveillance and administrative regulation and self-regulation.⁴⁶ In so doing, these writers assimilate medicine to narratives of modernity linked to 'the establishment of

disciplines, knowledge, and technologies that serve to proffer advice on how individuals should conduct themselves'.⁴⁷ Their work stresses the importance of medical knowledge and the 'normalization' of health regimes that discipline individuals to the larger aims of modern society. But though they comment lucidly on the regimentation of the body, as well as on the medical activities that contribute to the setting and policing of administrative norms and standards, they offer no detailed accounts of how, if at all, such conditions came to prevail. These sociologists offer only grand assumptions which, at best, are parasitic on medical history. By and large, historians have not taken up these themes for themselves.

WAR, MEDICINE AND MODERNITY

There is thus a crying need for a sustained analysis of the place of medicine in the larger history of the relationship between war and modernity. The chapters collected in this volume sketch in some of the starting points for such an analysis. Taken together, they demonstrate and provide insight into medicine's increasing involvement in the processes of modernity between the Franco-Prussian War and the Second World War. The chapters are presented in chronological order, but the coverage is inevitably episodic, and no effort is made to cover all the wars that might be regarded as relevant to the theme of medicine and modernity. America's war against Spain in 1898, for instance, like the war between Russia and Japan in 1904–5 and the Spanish Civil War of 1936–9, are all omitted, even though each of these was important for introducing new methods of organizing and treating military and civilian casualties, and for precipitating realignments in the relations between military and medical personnel and between civilian and military forms of medical aid.⁴⁸ Other less familiar wars, too, might well be relevant to an analysis of war, medicine and modernity. Thus a fuller narrative might have to consider some of the innumerable civil struggles, rebellions, nationalist uprisings, revolutions, guerrilla wars and massacres that occurred in China, Africa, India, Turkey, South America and elsewhere over the period.⁴⁹ After all, many of these conflicts were conducted against or provoked by imperialist rule, one of whose principle agents from the late nineteenth century was medicine.⁵⁰

Indeed, in the work of public health agencies, including those funded around the world by the Rockefeller Foundation, medicine served as a way of imposing the rationalizations of capital and philanthropy on native populations.⁵¹ In some cases, such medical agencies can clearly be seen as pursuing war by other means. In the Philippines, for instance, the guerrilla war of resistance against American control officially ended in May 1902. But it was followed by a further two years of sustained assault on a cholera epidemic that transformed the war from a struggle for territory into one for dominance over the indigenous people's bodies,

beliefs and social practices. American military surgeons supplemented the combat troops of the initial period of imperial conquest, prosecuting the 'war on cholera' along military lines, armed with experimental 'magic bullets' for 'shooting down' the germs of disease and resistance.⁵² In such cases, the attack on, containment and elimination of the 'enemy agents' extended well beyond any metaphoric war on disease. A fuller narrative would also have to include the continuing role of military medical organizations during peacetime, and also the ways that changes in medical organization achieved during wartime were developed and adapted to suit the needs of nation states and international relations in the periods between wars. The role of doctors in the League of Nations and in the Red Cross deserves further consideration in this respect.⁵³

Nevertheless, the wars focused on here, and the chronological approach adopted, provide a valuable first step towards a unified narrative of war, medicine and modernity. On the one hand, the chapters collected in this volume demonstrate that medical modernization during wartime took place, not according to some overarching and timeless logic, but rather through a multiplicity of local and contingent negotiations over power relations between doctors, military and civil authorities, and other interested medical actors and organizations. These case studies make clear the multiplicity of actors involved, and the local and specific nature of many of the medical problems addressed and the solutions adopted. Any fuller survey of the relations between war and modern medicine must inevitably pay attention to such diverse local developments. But on the other hand, it also becomes clear in reading these chapters that a number of themes do recur at different times and in different local contexts. Consequently, it also becomes possible to point to at least some of the features that may come to be regarded as characteristic of medicine in the age of modern warfare, and of medicine's role in bringing that age into being.

Taithe's chapter begins the analysis by looking at the part that medicine has played in blurring the boundaries between the spheres of military and civilian activity during wartime. He takes up the story during the Franco-Prussian War of 1870-1, as French military leaders appealed to the spirit of the revolution and the *levée en masse* to recruit civilians as well as soldiers to the war effort. As Taithe makes clear, the mobilization of medical resources through new 'humanitarian' agencies - notably the Red Cross - was officially sanctioned as a civilian operation free from any taint of nationalist military interest, and intended to mitigate the brutalizing effect of modern mechanized warfare. But such activities quickly became linked to the national war effort; Red Cross organizations came to serve as conduits for channelling civilian energies into the conduct of the war, and as a means of linking the pursuit of war to the pursuit of national identity more generally. Under the cover of this ambiguous humanitarianism, medical men were able to create for themselves a leading role in the management of modern warfare. In this instance, wartime medicine contributed to the

consolidation of the nation state precisely because it was seen to fulfil a caring and curing role that could ostensibly be distanced from the particularistic national interests that it in fact served.

Sutphen's study of medical initiatives during the Anglo-Boer War of 1899-1902 makes clear that such processes were nevertheless heavily dependent upon particular local circumstances. This conflict is often seen as another in which the boundaries between civilian and military spheres became obscured, particularly with the British forces' decision to intern large sections of the enemy civilian population during the closing stages of the conflict. This blurring did not extend to the medical management of health, however. During 1901, civilians and soldiers alike were threatened by the outbreak of plague in and around Cape Town. But as Sutphen shows, while the civil authorities were keen to draw the military into an expansion of their own public health measures by establishing a unified system of plague administration, the military saw little advantage in such collaboration. They feared that civilian measures, far from assisting in the maintenance of the health of the Army, would rather interfere in their efforts to manage their fighting forces. In the context of a colonial war, in which the Army relied primarily on manpower and supplies shipped in from overseas, the military had little need to mobilize the resources of colonial civilians. In this setting, military medicine remained just that; it was defined by the immediate needs of the military alone, and was conducted largely without reference to civilian expertise or advice.

No such separation between military and civilian medicine would be maintained during the First World War, the first of the 'total wars' of the twentieth century. In this conflict, the combination of mass mobilization with the growth of increasingly interventionist state machinery in many of the combatant nations provided unprecedented opportunities to create systems of medical practice and administration that effectively spanned the military-civilian divide. The point is explored in the six chapters in this volume that examine the development of medicine during the crucial years from 1914 to 1918.

Sturdy and Howell investigate how British physiologists managed to secure a role for themselves in the conduct of war-related research, and ultimately came to enjoy a position of some authority in managing and organizing that research and its application in the field. Their recruitment was part of a larger administrative experiment in which experts from various areas of civilian endeavour, including industry and business as well as academic science, were brought into the government to assist in organizing the nation's resources for the purposes of fighting the war.

Sturdy argues that the success with which physiologists established themselves as expert advisers to the government and the military at this time - particularly in relation to chemical warfare - cannot be attributed solely to their skill in generating innovations in military *matériel* and technique. It also owed much to

their ability to liaise between and help coordinate the work of different sections of the government machine, including both military and civilian branches of the state. Sturdy goes on to suggest that this combination of technical and organizational skills was not accidental; rather, the rational analysis and management of natural phenomena, and the forms of social organization needed to sustain such procedures, were already well established in the discipline of experimental physiology. Consequently, physiologists were well suited, by the very nature of their scientific training, to respond to and exploit the peculiar technical and social demands of modern warfare.

Howell's chapter likewise examines the recruitment of physiologists to address the novel problem of heart disease that arose in the course of the First World War. 'Soldier's heart' had long been known as one of the occupational hazards of soldiering, but in the context of the mass mobilization of 1914-18 disability due to this condition became a major manpower problem for the first time. As Howell shows, laboratory based clinical scientists were able to address these problems by formulating new functional definitions of heart disease rooted in physiological accounts of cardiac processes rather than in older ideas about anatomical lesions. This functional account of the processes taking place in living bodies, including the bodies of disabled soldiers, lent itself to the development of effective methods of managing those bodies, leading to significant improvements in the recovery and rehabilitation of heart disease cases. As a result, a new medical specialism - cardiology - began to coalesce, both during and after the war, around the deployment of these new technical knowledges and practices, and particularly around their application to the administrative problems of dealing with pensions claims from disabled soldiers.

The First World War is thus shown to provide a crucial site for the development of new kinds of medical organization and division of labour. Medicine was no longer simply an ancillary discipline to warfare, concerned merely with patching up the bodies of the injured. By the war's end it had become a key site for pursuing the kinds of technical and administrative innovations that were now increasingly seen as crucial for the prosecution of modern warfare. In particular, medical experts came to be valued for the contributions they were able to make to the mobilization of manpower and other resources - be they military or civilian, public or private - for the purposes of total war, and ultimately also for the pursuit of international competition by peaceable industrial and cultural means. As a result of the war, certain kinds of scientific medicine became central to the efforts of the modern state to maintain the health and productivity of the working population.

It is important to bear in mind that both Sturdy's and Howell's chapters are concerned chiefly with the high culture of government science and administration, and with the formulation and legitimation of policy rather than the details of its implementation. From this perspective, at least, it may be

possible to begin to sketch a narrative of modernization based around the growth of an increasingly inclusive medical gaze and system of medical administration. But as other chapters in this volume make clear, at the level of implementation such policies commonly met with resistance and negotiation, or were hedged around with qualifications and restrictions on the limits of their applicability. Nothing was inevitable.

Thus Jensen's chapter examines the efforts of American women physicians to secure a place in military medicine after the United States entered the war in 1917. Their demands to be considered for service alongside their male colleagues were backed up by a language of citizenship drawn from recent successful campaigns for women's suffrage. In the context of mobilization for total war, one might expect that this universalizing and integrationist language would have served to make a compelling case for including women doctors among the nation's warfighting resources. In the event, however, while women physicians were offered work in the lowly capacity of contract surgeons, they were denied the commissions and officer status granted to their male counterparts. Whatever the war may have done to blur the boundaries between military and civilian life, pre-war assumptions about the demarcation of masculine from feminine gender roles still posed a serious barrier to the recruitment of women into military medicine.

Cooter's chapter on military and medical concerns about malingering among soldiers identifies a rather different source of resistance to the totalizing and universalizing trends of modernity. On the one hand, official efforts to detect and discipline malingerers did indeed give rise to medical theorizations and policy recommendations that cast doctors as agents of a supervisory and regulatory warfare state, charged with managing military manpower by means of new psychological and clinical techniques. But on the other hand, the impact of such theories and policies on the actual practices of military doctors appears to have been strictly limited. As Cooter shows, grass-roots practitioners resisted the disciplinary role they were expected to play in relation to the soldiers under their charge. Moreover, they did so as part of a more general antipathy to the imposition of disciplinary controls upon their own practice - an antipathy that extended, not just to the terms of their military service during the war, but also to the threat of state control of the profession during peacetime. Ironically, in this respect, doctors were well aware of the extent to which the military and civilian arms of the modern state tended to operate in concert within a common and increasingly integrated system of government administration. As a result, they resisted subjection to the disciplinary power of the state in both areas simultaneously.

In the following chapter, Thomson looks at how the identification and treatment of 'mental defectives' was affected by the events of the First World War in Britain and the United States. In Britain, where military manpower issues

revolved chiefly around the need to pour ever larger numbers of men into the trenches with little regard for their levels of training or skill, questions of mental fitness commanded little attention. Consequently, many who might otherwise have been identified as mentally defective were simply absorbed into the anonymous mass of fighting men. In the United States, by contrast, recruitment from a much larger population, combined with the expense of maintaining a fighting force a long way from home, meant that far more attention was paid to weeding out the mentally unfit and defective by means of various psychometric and educational tests. In the US, then, systems of medical surveillance and manpower management – quintessential elements of medical modernity – were strengthened as a result of the war, whereas in Britain no such system was deemed necessary; in this instance modern warfare, and its medical corollary, was instantiated differently in different national contexts. Any attempt to identify universal patterns of medical modernization must therefore take account of the contingent local circumstances that influenced the way in which manpower problems, among other things, were construed.

One area of moral activity in which medical surveillance and control was unequivocally expanded in all major combatant nations during the First World War was sexuality. Sauersteig's paper charts this expansion by looking at the management of venereal disease in the theatre of war and on the home front, particularly in Germany and Britain. Like heart disease, venereal disease quickly came to be seen as a serious threat to fighting power. Medical men responded with unprecedentedly public debates over the nature and regulation of sexuality, and with recommendations for the rational management of sexual behaviour. The difficulties of keeping large armies of men away from home quickly led to the temporary suspension of normal sexual restraints and to acceptance of extramarital sexual activity – tacitly, through provision of prophylactics and the means of post-coital disinfection, and expressly, through licensing and policing of brothels. In such measures, and in their legitimizing rhetoric of sexuality as a normal biological urge whose fulfilment is a natural part of a healthy life, we might discern the beginnings of a shift away from an older world of respectable sexual restraint and illicit sexual activity, and towards a more modern epoch of free sexual expression.

As Sauersteig makes clear, however, this liberalization of sexual norms was chiefly restricted to men, and especially fighting men. He thus follows Jensen in demonstrating that, whatever medicine may have contributed to the development of more rational forms of social integration and mobilization between 1914 and 1918, these processes were limited by the persistence of older gender roles and identities. The First World War is commonly depicted as a time of political and occupational emancipation for women. It is clear, however, that women were generally recruited into wartime industry on terms much less favourable than those of adult male workers.⁵⁴ Likewise, the liberalization of sexual norms was far less marked for

women than for men. Indeed, formal and informal methods of policing the sexual activity of women in civilian life generally became more extensive and more repressive than ever before, at the same time as women were recruited into army brothels to provide sexual amenities for soldiers.

If anything stands out about the processes of medical modernization during the First World War, it is the growing dominance of modes of thought and practice informed by dynamic and functionalized understandings of the body. Such thinking was central to many of the innovations in preventive and therapeutic practice and in medical surveillance and regulation that were developed in the course of the war. But physiological and psychological models also contributed to the emergence of new ways of thinking about social functions, and about how best to harness diverse social resources, in particular manpower, to the national effort. War itself now came to be seen as a process of technical, strategic and social innovation that tested the vigour and adaptability, not just of the military, but of the social organism as a whole. In this context, medicine in both its military and civilian aspects was increasingly seen to fulfil a vital function in the organization, mobilization and management of entire societies.

Nevertheless, it cannot be stressed too strongly that the advancement of such ways of thinking – rational, processual, calculative and integrative – did not simply follow some preordained and disembodied logic of modernization. On the contrary, they were adapted to take account of the particular circumstances under which different nations went to war and the different military and industrial manpower problems they faced, as well as older traditional suppositions about men's and women's roles in war and peace. The story of medicine in the First World War is thus one of piecemeal and partial realization of the social processes deemed characteristic of modernity. Moreover, it is simply not clear just how far these elements of medical modernity persisted into the interwar years, though there are suggestions in the chapters by Cooter, Thomson and Sauersteig that many of the medical developments of the war were quickly abandoned or forgotten thereafter.

With the descent into renewed global conflict in 1939, however, the relations between medicine, war and modernity were once again thrown into stark relief. The chapter by Starns on British nursing during the Second World War suggests that gender roles, and especially the inferior status of women workers, again tended to be reinforced rather than alleviated by the recruitment of women to the war effort. Though military nurses enjoyed a modest rise in status during the war, their civilian counterparts suffered a contrary fate. Large numbers of barely trained women were recruited to care for the anticipated casualties of enemy bombing, and the profession suffered dilution, deskilling and a general loss of status and respect as a result. Subsequently, some nursing reformers sought to reverse this process by remodelling the profession along expressly militarist lines. They did so, however, by looking back to an older military culture of unquestioning obedience, discipline

and 'character' rather than training, skill and functional efficiency. The adoption of this image tended to confirm older popular notions of nursing as an extension of women's domestic work, and thus contributed to its continued low status. In the postwar world, civilian women were unwilling to submit to such discipline without the compensation of travel and adventure, and recruitment fell rather than rose. For the nursing profession then, the Second World War was an unmitigated disaster; far from becoming part of modern technical medicine, nursing tended to retreat into a more traditional world of gendered subordination.

This contrasts dramatically with the modernization that took place in certain spheres of war-related industrial production. Neushul's chapter looks at a key medical contribution to the war effort, namely the development of penicillin. Despite some encouraging clinical results from Britain, and considerable interest from the military, American pharmaceutical companies were reluctant to undertake production using existing fermentation methods. They preferred to hold out in the hope of developing a commercially advantageous synthetic process. They only adopted fermentation following a number of crucial interventions by government organizations, most importantly the development of a pilot plant which demonstrated that the drug could be produced in commercial quantities by fermentation, and the organization of clinical trials which made clear the medical, strategic and commercial value of the new drug. As Neushul stresses, the war greatly accelerated the transfer of medical technology across a number of important boundaries: from Britain to the US, from the civilian to the military sphere and back, from state science laboratories to private companies and mass production, and from clinical testing to the bedside. Importantly, these lines of transfer and communication remained open after the war had ended. The pharmaceutical industry underwent a lasting modernization as increased integration of private companies with the state, and of scientific research with industrial production, led to further developments in the mass production and administration of new and standardized medical treatments.

Other boundaries to be broken down in the course of the Second World War included those that demarcated the limits of the individual self. Bourke's paper examines the medical literature on psychological management – particularly the management of fear – that burgeoned during the war, to show how the emotions were brought under the purview of scientific accounts of human behaviour. Privileged in these accounts was a dual understanding: of internal processes of development and learned control; and of the social connections to the group that enforced and reinforced these internal mechanisms. Psychologists posited deterministic theories and recommended mechanisms for the regulation of both these dimensions of mental discipline. The inward self at once became visible to the scientific gaze and was located within a social nexus that rendered it capable of direct supervision and manipulation. Bourke argues that this discourse of total psychological control developed as a response to what was seen to be the

emotional impact of modern mechanized warfare with its awesome and dehumanizing power to kill. Within this discourse, modernity itself was conceptualized as a threat to psychological well-being, as over-refined emotional sensibilities were confronted by the speed and technological sophistication of modern life, of which war was only an extreme manifestation.

Weber would not have been surprised at this diagnosis; here was an echo of his own views, not only on modernity, but on war in relation to it. What he would not have shared was the solution favoured by psychologists and military commanders alike: the advancement of ever more refined scientific techniques for studying the soul of modern humanity and for managing the emotions and behaviour of mass armies and the populations from which they were drawn. In the twenty-five years since his death, the world had moved on. And while modernity certainly brought with it its own tensions and contradictions, stresses and anxieties, it was also increasingly seen to offer the solutions to these problems. Medicine was one of the foremost among the institutions offering such solutions, be it through the elucidation of individual and crowd psychology, or through the astonishing new drugs issuing from the laboratories and plant of the pharmaceutical industry.

The essays in this volume document in precise historical detail some of the ways that medicine participated in the making of that modernity. It was central to the creation of a calculus of rational society, to the elaboration of an administrative way of knowing, and to the development of bureaucratic technologies for managing the human body and mind. Medicine did not simply minister to modernity; it was one of the key means of bringing that modernity into being. And medicine's involvement in war, in particular, provided a crucial moment for the emergence of many of the material and social technologies that we now see as quintessentially modern. Weber himself realised that this was the case. Involved in the administration of army hospitals in Baden during the First World War, he had observed the way that military bureaucracy enhanced medical efficiency and patient discipline.⁵⁵ The chapters collected here expand on this observation. By examining the role of medicine in war, we can begin to understand the processes by which some of the most pervasive institutions of modernity, from the vast machinery of medical industry and administration to the most intimate of bodily and mental experiences, were shaped by the imperative to regiment and regulate human life for the purpose of conflict between nations.

ACKNOWLEDGEMENT

Thanks to Lutz Sauerteig for his comments on an earlier draft of this introduction.

Notes

¹ Max Weber, 'Bureaucracy' in H. H. Gerth and C. Wright Mills (trs and eds), *From Max Weber: Essays in Sociology* (London, Routledge & Kegan Paul, 1946), pp. 196–244.

2 Jürgen Habermas, 'Technology and Science as "Ideology"' in his *Toward a Rational Society*, tr. Jeremy Shapiro (London, Heinemann, 1971), p. 81.

3 See Scott Lash and Sam Whimster (eds), *Max Weber, Rationality and Modernity* (London, Allen & Unwin, 1987); Detlev J.K. Peukert, *Max Webers Diagnose der Moderne* (Göttingen, Vandenhoeck and Rupprecht, 1989); Peter Wagner, *A Sociology of Modernity: Liberty and Discipline* (London, Routledge, 1994).

4 Weber, 'Science as a Vocation' in *From Max Weber*, pp. 129-56.

5 Quoted in J.P. Mayer, *Max Weber and German Politics* (London, Faber & Faber, 1943), pp. 127-8.

6 Weber, 'Bureaucracy', p. 215.

7 See Daniel Pick, *War Machine: The Rationalization of Slaughter in the Modern Age* (New Haven, Yale University Press, 1993).

8 John Brewer, *The Sinews of Power: War, Money and the English State, 1688-1783* (New York, Knopf, 1988).

9 Alan Forrest, *Conscripts and Deserters: The Army and French Society During the Revolution and Empire* (Oxford University Press, 1989); Forrest, *Soldiers of the French Revolution* (Durham, NC, Duke University Press, 1990). See also Geoffrey Best, *War and Society in Revolutionary Europe, 1770-1870* (Leicester University Press, 1982).

10 Ken Alder, *Engineering the Revolution: Arms and Enlightenment in France, 1763-1815* (Princeton University Press, 1997). Thanks to Donald MacKenzie for this reference.

11 Pick, *War Machine*, ch. 12: 'The Rationalization of Slaughter'.

12 John Ellis, *The Social History of the Machine Gun* (London, Cresset Library, 1975), esp. ch. 2: 'Industrialised War'.

13 See Michael Mann, *States, War and Capitalism: Studies in Political Sociology* (Oxford, Blackwell, 1988), p. 124; Alfred Vagts, *A History of Militarism: Civilian and Military* (London, Hollis & Carter, 1959), p. 453; Michael Geyer, 'Militarization of Europe, 1914-1945' in John R. Gillis (ed.), *The Militarization of the Western World* (New Brunswick, NJ, Rutgers University Press, 1989), pp. 78-9.

14 Weber, 'The Meaning of Discipline' in *From Max Weber*, p. 261.

15 Cited in Pick, *War Machine*, p. 101.

16 Marx to Engels, 7 July 1866, in Karl Marx and Friedrich Engels, *Selected Correspondence* (3rd edn, Moscow, Progress Publishers, 1975), p. 169, original emphasis. Engels was to generalize on this point a decade later in *Anti-Dühring*.

17 Guy Emerson Bowerman, Jr, *The Compensations of War: The Diary of an Ambulance Driver During the Great War*, ed. M.C. Carnes (Austin, University of Texas Press, 1983), p. 32.

18 Guy Chapman, *A Passionate Prodigality: Fragments of an Autobiography* (Leatherhead, Ashford, Buchan & Enright, 1985, 1st edn 1933), p. 80.

19 The literature linking the welfare to the warfare state is surprisingly thin. While theories of state formation up to the early twentieth century pay due regard to the importance of militarist interests, work on the welfare state is overwhelmingly concerned with the influence of socio-economic development and the politicization of the working class. Only recently have historians begun to explore the militarist dimensions of welfare. See Young-Sun Hong, *Welfare, Modernity and the Weimar State, 1919-1933* (Princeton University Press, 1998). Theda Skocpol, *Protecting Soldiers and Mothers: The Political Origins of Social Policy in the United States* (Cambridge, MA, Belknap Press, 1992), attributes the

limited extent and strongly maternalist orientation of American welfare in the early to mid-twentieth century to the relative weakness of the warfare state at that time.

20 Modris Eksteins, *Rites of Spring: The Great War and the Birth of the Modern Age* (New York, Doubleday, 1989), p. xvi.

21 Samuel Hynes, *A War Imagined: The First World War and English Culture* (New York, Atheneum, 1991).

22 Paul Fussell, *The Great War and Modern Memory* (Oxford University Press, 1975).

23 Pick, *War Machine*, esp. p. 260. See also Cecil D. Eby, *The Road to Armageddon: The Martial Spirit in English Popular Literature, 1870-1914* (Durham, NC, Duke University Press, 1987). Jay Winter, not in this tradition, challenges 'modernist' interpretations, arguing that communities made sense of the First World War within traditional frames of reference: *Sites of Memory, Sites of Mourning: The Great War in European Cultural History* (Cambridge University Press, 1995).

24 Elaine Showalter, 'Rivers and Sassoon: The Inscription of Male Gender Anxieties' in Margaret R. Higonnet, J. Jensen, S. Michael and M.C. Weitz (eds), *Behind the Lines: Gender and the Two World Wars* (New Haven, Yale University Press, 1987), pp. 61-9; Showalter, *The Female Malady: Women, Madness, and English Culture, 1830-1980* (New York, Pantheon Books, 1985).

25 Omer Bartov, *Murder in Our Midst: The Holocaust, Industrial Killing, and Representation* (New York, Oxford University Press, 1996); Zygmunt Bauman, *Modernity and the Holocaust* (Cambridge, Polity Press, 1989). See also Anthony Giddens, *The Nation-State and Violence* (Cambridge, Polity Press, 1985). Correcting the historically slipshod nature of much of this work is Paul Weindling, *Delousing Eastern Europe: German Bacteriology between Disinfection and Genocide, 1890-1940s* (Oxford University Press, forthcoming). For debate on structure and agency in the Holocaust, see Michael Burleigh, *Death and Deliverance: 'Euthanasia' in Germany, c. 1900-1945* (Cambridge University Press, 1994); Henry Friedlander, *The Origins of Nazi Genocide: From Euthanasia to the Final Solution* (Chapel Hill, University of North Carolina Press, 1995); Daniel J. Goldhagen, *Hitler's Willing Executioners: Ordinary Germans and the Holocaust* (New York, Alfred A. Knopf, 1996). Goldhagen's book has excited furious controversy; see for instance Norman G. Finkelstein and Ruth Bettina Birn, *A Nation on Trial: The Goldhagen Thesis and Historical Truth* (New York, Holt, 1998).

26 See also Eric Loefer, *No Man's Land: Combat and Identity in World War I* (Cambridge University Press, 1979); George Mosse, *Fallen Soldiers: Reshaping the Memory of the World Wars* (Oxford University Press, 1990).

27 Weber, 'The Meaning of Discipline', p. 261.

28 Cf. Scott Lash, 'Modernity or Modernism? Weber and Contemporary Social Theory', in Lash and Whimster (eds), *Max Weber*, pp. 355-77.

29 Ulrich Beck, 'How Modern is Modern Society?', *Theory, Culture & Society*, 9 (1992), p. 163. Beck's own concern with risk calculation and labour indicate his Weberian lineage. Interestingly, he even takes Giddens to task for his preoccupation with knowledge to the exclusion of other more concrete aspects of social life.

30 Mick Imlah, *Independent on Sunday*, 30 October 1994, p. 40 in his review of Geoff Dyer, *The Missing of the Somme* (London, Hamish Hamilton, 1994). See also Craig Calhoun, 'Postmodernism and Pseudohistory', *Theory, Culture & Society*, 10 (1993), 75-96; David Harvey, *The Condition of Postmodernity* (Oxford, Blackwell, 1990).

31 For a fuller account and critique, see Roger Cooter, 'War and Modern Medicine' in W.F. Bynum and Roy Porter (eds), *Companion Encyclopedia of the History of Medicine* (London, Routledge, 1993), pp. 1536-73.

32 See Deborah Dwork, *War is Good for Babies and Other Young Children: A History of the Infant and Child Welfare Movement in England, 1898-1918* (London, Tavistock, 1987); J.M. Winter, *The Great War and the British People* (London, Macmillan, 1985); Richard Timuss, 'War and Social Policy' in his *Essays on 'The Welfare State'* (2nd edn, London, Allen & Unwin, 1963), pp. 75-87.

33 There are good examples in Erich Maria Remarque's *All Quiet on the Western Front* (Boston, Little, Brown & Co., 1993, orig. pub. 1928); for many other examples (including those of boredom and bureaucracy), see the diaries cited in Joanne Bourke, *Dismembering the Male: Men's Bodies, Britain, and the Great War* (University of Chicago Press, 1996).

34 Michael Kater, *Doctors Under Hitler* (Chapel Hill, University of North Carolina Press, 1989); Sheldon H. Harris, *Factories of Death: Japanese Biological Warfare 1932-45* (London and New York, Routledge, 1994). See also David Rothman, *Strangers at the Bedside: A History of How Law and Bioethics Transformed Medical Decision Making* (New York, Basic Books, 1991), ch. 2: 'Research at War'.

35 C.H. Firth, *Cromwell's Army* (London, Methuen, 1902), quoted in 'The Army Surgeon in Cromwell's Time', *Medical Record* (6 September 1902), 379.

36 The term is Wilfred R. Bion's who criticized such 'othering' of war in his *The Long Week-End, 1897-1919, Part of a Life*, ed. Francesca Bion (London, Free Association Books, 1986).

37 Timuss, 'War and Social Policy', p. 77.

38 Geoffrey Best, '[Series] Editor's Preface' in his *War and Society*, Arthur Marwick (ed.), *Total War and Social Change* (London, Macmillan, 1988).

39 For historical essays on this theme, see Peter Wright and Andrew Treacher (eds), *The Problem of Medical Knowledge: Examining the Social Construction of Medicine* (University of Edinburgh Press, 1982).

40 See Mark Harrison, 'The Medicalization of War - The Militarization of Medicine', *Social History of Medicine*, 9 (1996), 267-76.

41 Manfred Berg and Geoffrey Cocks (eds), *Medicine and Modernity: Public Health and Medical Care in Nineteenth- and Twentieth-Century Germany* (Cambridge University Press, 1997).

42 *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (Berkeley, University of California Press, 1992).

43 *The Railway Journey: The Industrialization of Time and Space in the 19th Century* (Leamington Spa, Berg, 1977).

44 For an excellent overview and bibliography, see Paul Lerner and Mark S. Micale, 'Trauma, Psychiatry and History: An Introduction' in Lerner and Micale (eds), *Traumatic Pasts: Studies in History, Psychiatry and Trauma in the Modern Age* (Cambridge University Press, forthcoming).

45 For example, Martin Stone, 'The Military and Industrial Roots of Clinical Psychology in Britain, 1900-1945' (unpub. Ph.D. thesis, University of London, 1983); Paul Lerner, 'Hysterical Men: War, Neurosis and German Mental Medicine, 1914-1921' (unpub. Ph.D. thesis, Columbia University, 1996); Marc Oliver Roudiez, 'A Battle of Nerves: Hysteria and its Treatment in France During World War I' (unpub. Ph.D. thesis, University of California, Berkeley, 1995).

46 See, for example, David Armstrong, *Political Anatomy of the Body: Medical Knowledge in Britain in the Twentieth Century* (Cambridge University Press, 1983); Armstrong, 'Public Health Spaces and the

Fabrication of Identity', *Sociology*, 27 (1993), 393-410; Armstrong, 'The Temporal Body' in Roger Cooter and J.V. Pickstone (eds), *The History of Medicine in the Twentieth Century* (Reading, Harwood International, forthcoming); Bryan Turner, *Regulating Bodies: Essays in Medical Sociology* (London, Routledge, 1992); *idem*, *The Body and Society: Explorations in Social Theory* (Oxford, Blackwell, 1984). See also Nikolai Rose on the history of psychology: *Governing the Soul: The Shaping of the Private Self* (London, Routledge, 1990).

47 Deborah Lupton, *The Imperative of Health: Public Health and the Regulated Body* (London, Sage, 1995), p. 9.

48 Little has been written on medicine in either the Spanish-American War or the Russo-Japanese War, but see Jim Connor, 'Before the World in Concealed Disgrace': Physicians, Professionalization and the Cuban Campaign of the Spanish-American War', and Claire Herrick, 'The Russo-Japanese War of 1904-5 and British Military Medicine', both in Roger Cooter, Mark Harrison and Steve Sturdy (eds), *Medicine and the Management of Modern Warfare* (Amsterdam, Rodopi, forthcoming). On medicine and the Spanish Civil War, see Jim Fyfe, *The Signal was Spain: The Aid Spain Movement in Britain, 1936-39* (London, Lawrence and Wishart, 1986).

49 See George C. Kohn, *Dictionary of Wars* (New York, Anchor, 1986), for an alphabetical listing of such events.

50 See David Arnold (ed.), *Imperial Medicine and Indigenous Societies* (Manchester University Press, 1988); Roy MacLeod and Milton Lewis (eds), *Disease, Medicine and Empire* (London, Routledge, 1988); Donald Denoon, *Public Health in Papua New Guinea: Medical Possibility and Social Constraint, 1884-1984* (Cambridge University Press, 1989); Megan Vaughan, *Caring Their Ills: Colonial Power and African Illness* (Cambridge, Polity, 1991).

51 See John Eitling, *The Germ of Laziness: Rockefeller Philanthropy and Public Health in the New South* (Cambridge, MA, Harvard University Press, 1981); A. Salarzano, 'Sowing the Seeds of Neo-imperialism: The Rockefeller Foundation's Yellow Fever Campaign in Mexico', *International Journal of Health Services*, 22 (1992), 329-54; Soma Hewa, 'The Hookworm Epidemic on the Plantations in Colonial Sri Lanka', *Medical History*, 38 (1994), 73-90; Paul Weindling, 'Public Health and Political Stabilization: The Rockefeller Foundation in Central and Eastern Europe Between the Two World Wars', *Mimosa*, 31 (1993), 253-67.

52 Reynaldo C. Ileto, 'Cholera and the Origins of the American Sanitary Order in the Philippines' in Arnold (ed.), *Imperial Medicine*, pp. 125-48, at pp. 131-3.

53 See, however, Paul Weindling (ed.), *International Health Organizations and Movements* (Cambridge University Press, 1995); John Hutchinson, *Champions of Charity: War and the Rise of the Red Cross* (Boulder, Colorado, Westview Press, 1996).

54 Higginet et al. (eds), *Behind the Lines*. And on the use of medical experts to regulate the activity of women in wartime industry, see Antonia Ineson and Deborah Thom, 'I.N.T. Poisoning and the Employment of Women Workers in the First World War' in Paul Weindling (ed.), *The Social History of Occupational Health* (London, Croom Helm, 1985), pp. 89-107.

55 Max Weber, *Zur Politik in Weltkrieg. Schriften un Reden, 1914-1918*, ed. Wolfgang J. Mommen (Tübingen, J.C.B. Mohr), pp. 1-16.