Defining hunger, redefining food: Humanitarianism in the twentieth century

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Preface

This thesis concerns the history of humanitarian nutrition and its political implications. Drawing on aid agency archives and other historical sources, it examines how food has been delivered in emergencies, from the First World War to the present day. Most studies of humanitarianism concern institutional politics or economic structures. In this research, I examine humanitarian practice. My approach is ethnographic: it is a study of the micro-level practices of relief, examining the objects distributed, the plans made, the techniques used. It is also historical: examining how such practices have changed over time. In this thesis, I focus attention on the middle of the twentieth century, from the 1930s to the 1970s, which, I argue, was a formative period for humanitarian nutrition.

My research has been oriented around a number of interlocking questions. First of all, I am interested in the practical details of nutritional relief, both now and in the past. What do humanitarians actually do when they arrive at a new emergency and start tackling starvation? How do they measure hunger? How do they provide sustenance? Second, I am interested in how this has changed, using history to question our current way of doing things. Why do we measure hunger and provide food in these particular ways? Have we always done it in these ways? What historical forces have shaped the way we deliver nutritional relief? Finally, I am interested in the implications of these practices. How have these nutritional practices changed the way we conceive of hunger and food? What are the politics embedded in these technical procedures?

In answering these questions, I have structured the thesis in three main parts. The first part contains preliminaries: a sketch of humanitarian nutrition to illustrate the field I am concerned about, and a chapter on theory and methods. The second part

examines the history of emergency foods. Entitled 'Providing for the Body', it is a study of how humanitarians have fed people, examining the history of novel foods such as Plumpy'nut, Single Cell Proteins, and Corn-Soy Blend. The third part examines how humanitarians have assessed starvation over the past century. Entitled 'Making Hunger Visible', it is a study of the techniques used to measure malnourishment, which require tools like the MUAC Band, a strip of colourful tape, which is wrapped around the bicep of young children to measure their wasting.

Throughout these sections, I make five interlocking arguments. First, I make a political point: that humanitarian action is always political, and that it is impossible to adhere to 'classical' humanitarian principles such as neutrality, impartiality and independence. Second, I make a sociological argument: that the activities of humanitarian nutrition have been shaped by a number of themes, which include militarism, modernity, markets, and medicine. Third, I make a historical argument: that the main features of humanitarian nutrition were developed in the middle of the twentieth century, and that its form was largely standardised by the time of the Biafran war. Fourth, I make a theoretical argument: that these mid-century changes were associated with a profound redefinition of hunger and food, with hunger becoming a biochemical deficiency, and food a collection of nutrients. Finally, I make a normative argument, suggesting that these changes have not necessarily been beneficial to people at the receiving end of interventions: for many starving populations, hunger has been identified impersonally and dispassionately, and food has been provided with more concern for control than with the societal needs of the sufferers.

Before beginning the thesis, a number of clarifications are in order. First, this is not a study of what has become known as 'south-south' humanitarianism. When conceived very broadly, humanitarianism has a number of manifestations, which can

include a variety of interventions across cultures and religions. But the subject of this thesis is the dominant, Western, institutionalized humanitarianism of the modern age. This is a study of my own society. It is a study of how, in Western Europe and America, we have acted on people in the rest of the world. Indeed, my focus is more specific than that: it is the nutritional wing of this institutionalized humanitarianism, found in its 'emergency' form.

Second, I have made some terminological choices, which require a brief warning. Throughout the thesis, I use the words 'humanitarianism', 'relief' and 'aid' interchangeably; I also speak of 'disaster relief', 'humanitarian aid', or 'humanitarian relief'. I do this primarily to introduce some variety to the prose, but the reader should be warned that my usage might constitute an anachronism in some contexts, since each word has a particular historical resonance. The term 'humanitarianism', for example, has only really taken off since the end of the Cold War, and the term 'disaster relief' was older, and far more common in the 1970s and 1980s. Nevertheless, I use these terms interchangeably to prevent my writing becoming repetitive. For me, they refer to the same thing: the modern, Western set of institutions and practices, which seek to provide short-term relief to suffering people.

A similar health warning should be applied to the terms 'hunger, 'starvation', and 'malnutrition'. Certain readers will feel that I am using these interchangeably, eliding the considerable differences between them. Malnutrition is usually seen as a biochemical condition – some kind of imbalance in nutrient intake. Hunger is usually seen as a sensation, the subjective feeling that comes from not eating enough food. Starvation is a term that often sits between these extremes, when hunger begins to affect health and leads to physical breakdown. For this thesis, I required a term that was more general, encapsulating the entire experience of dearth, from bodily changes to subjective feelings. One of my main arguments is to question the idea of hunger as

a purely physical, biochemical experience, so I needed a word that shows the diversity of this experience. In most cases, 'hunger' seemed sufficiently general for this purpose, embracing collective, social forms ('widespread hunger'), as well as more specific physical processes ('pangs of hunger'). However, on some occasions I have reached for other words, either for variety, or to emphasise a particular effect of hunger.

Finally, I have a warning about anthropometry, which can be defined as the measurement of the human body. In humanitarian nutrition, anthropometry can be used in four main ways: to study the growth of a child over time (a longitudinal approach); to survey the health of a whole population (a cross-sectional approach); to monitor how malnutrition levels are changing (a combination of the above); and to screen people, taking a one-off measurement to determine eligibility for food. Of these, anthropometric screening is the main focus of this thesis. It is an approach that is particular to emergencies, so when I speak of nutritional anthropometry (and the intellectual assumptions on which it is based), the reader should assume I am speaking of emergency anthropometric screening, unless I indicate otherwise. Some of my arguments would not apply to anthropometry as a survey method, for example, which is based on much stronger foundations.

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PART I

PRELIMINARIES

1.

Waxing tender over drowning flies

The definition and scope of humanitarianism

In 1879, a commentator in the *Saturday Review* wrote an article on the sentiment of humanity. It concerned the growing preoccupation with human suffering in late-Victorian society. 'When men speak as if their own generation were a peculiar people,' the article began, 'they are generally mistaken. Yet it is impossible to doubt that the present age is not only one of transition, but one of humane feeling. Our mild blue eyes wax tender over drowning flies: over Russian political prisoners, exiled Circassians, oppressed Bulgarians, and many other persons who probably never expected to be pitied... We really do heartily abhor cruelty.'[1]

These observations about growing humanitarian concern in 19th century Britain were nothing new; in fact, a similar transition was going on in most other industrialised countries at the time. From the end of the 1700s a revolution in moral attitudes took place across Western Europe and North America, accompanied by a rapid expansion in the institutional provision of alms. There was a rise in foundations giving relief to the destitute, and a growing movement for the abolition of slavery. There was a growth in security for the poor at home, and attempts at improvement for the poverty-stricken populations abroad. There was reform of prisons in peacetime, and attention to the wounded during wartime. Humanitarian reformers directed their attention at housing, schooling, employment, conflict, leisure, and food. The growth

[1] 'The sentiment of humanity', *Saturday review of politics, literature, science and art* 48. 1247 (Sep 20, 1879): 347. Punctuation altered. The quoted phrase is from Tennyson's *In Memoriam A.H.H*: 'You say, but with no touch of scorn/ Sweet-hearted, you, whose light-blue eyes/ Are tender over drowning flies/ You tell me, doubt is Devil-born.'

of these campaigns, and the new moral status assigned to them, indicate the arrival of something new. [2]

The origins of humanitarianism

Little is gained by collecting such a diverse array of activities under a single banner, but the term 'humanitarianism' also arrived in the mid-19th Century, and was put to work as a capacious, all-embracing noun. The word had existed for some time, referring to a theological position – a belief in Christ's humanity rather than his divinity – but in the 1840s and 1850s a new definition rose to prominence, describing a voguish concern for other people's suffering and carrying pejorative connotations: with overtones of sentimentality in excess, and a perverse preoccupation with the lives of distant and deviant people.[3] In the first cluster of appearances in the London *Times*, humanitarianism appears as something to be sneered at, something 'sickly', lamented as the repetitive cry issued by 'feeble-minded people'.[4] Perhaps the most memorable portrayal of humanitarianism in this mode is the character of Mrs Jellyby in Dickens' *Bleak House*, a woman so concerned with the inhabitants of a distant African tribe that she neglects the suffering within her own family.[5] But over the course of the later 19th Century, and particularly in the 1880s and 1890s, we can see more positive uses of the term come to dominate. In British and American periodicals

[2] A number of historical studies have considered this rise in humanitarianism. Stefan Collini, *Public moralists: political thought and intellectual life in Britain 1850-1930* (Oxford: Clarendon Press, 1991), 60-90; Thomas Haskell, 'Capitalism and the origins of humanitarian sensibility, part one', *American Historical Review* 90, no. 2 (1985): 339-61; Frank Prochaska, 'Philanthropy', in *The Cambridge social history of Britain 1750-1950, volume 3*, ed. Francis Michael Longstreth Thompson, (Cambridge: Cambridge University Press, 1990).

[3] The Oxford English Dictionary summarises this tradition of negative connotations, as well as its transition from theology. For an early reference to humanitarianism as a voguish new trend, see *The Times*, Saturday, Dec 13, 1856; pg. 8; Issue 22550; col D.

[4] Editorial in *The Times*, Saturday, May 29, 1847; pg. 4; Issue 19562; col F. Editorial in *The Times*, Monday, Nov 13, 1876; pg. 10; Issue 28785; col B. Editorial in *The Times*, Tuesday, Dec 23, 1856; pg. 6; Issue 22558; col C.

[5] Charles Dickens, *Bleak House* (Ware: Wordsworth, 1994). Originally published in instalments during 1853 and 1854.

'humanitarianism' became applied more often, and more favourably, to a whole gamut of new activities.

These activities were fascinatingly multifarious, and reveal a lot about the preoccupations of the age. They included a concern for the humane treatment of soldiers in war, as led by Florence Nightingale in the Crimean War, and Henri Dunant after the Battle of Solferino. They included the 'civilising mission' of colonial civil servants and missionaries, who established schools, hospitals, and infrastructure overseas. They included the campaigns against flogging and cruelty in prisons, whose outspoken criticisms hit the letters pages of the new national newspapers. And they included fundraising appeals to send resources to committees overseas, as an early form of non-governmental famine response. Through these activities, 'humanitarianism' was transformed from being a theological term, and then a dismissive reference to sentimentality and mawkishness, to become a noun embracing a quite bewildering array of activities. These activities were generally considered positive, but they came from a variety of motives and had an array of effects on the world, targeting groups as diverse as the heathens of distant lands, the heroes of the national military, and the troublemakers of the slums.

In the early 20th Century a new collection of practices emerged, which increasingly came to dominate what we think of as humanitarianism. Often described as 'humanitarian aid', or 'disaster relief', these became particularly prominent after the First World War, when a number of new organisations were founded to provide food, water, shelter, and medical care to people in emergencies. One of the first was Save the Children, founded by Eglantyne Jebb in 1919; others included the American Relief Administration led by Herbert Hoover, the League of Nations High Commissioner for Refugees led by Fridtjof Nansen, and the League of Red Cross Societies, founded in 1919 to offer relief in situations not mandated to the ICRC (such

as natural disasters and civil conflicts).[6] These institutions provided basic services to people in desperate need. The Russian famine of the early 1920s was a significant moment in the development of this new sense of humanitarianism, as it saw the mobilisation of relief programmes on a massive scale for the first time, and the adoption of many approaches still in use today.

Over the past century, the term humanitarianism has increasingly been restricted to this narrower collection of activities. It has become distinguished from both 'development' (the long-term project of improving people's wealth, wellbeing and life chances), and from localised charity (providing assistance to neighbours and nearby communities). Similarly, humanitarianism has been increasingly distinguished from *long-term provisions* (such as the establishment of permanent health services, which were classed as welfare), as well as from *short-distance* interactions (such as homeless shelters or soup kitchens, which were classed as charity or philanthropy).[7] Three characteristics, therefore, came to define humanitarianism: a *global reach*: the idea that basic assistance should be offered to people in famines, disasters, and wars regardless of their location; a *short-term remit*: the idea that humanitarianism should be associated with provision in emergencies, rather than in conditions of protracted disadvantage; and a *universal ethic*: the idea that people should be helped regardless of their politics or nationality. This was a far cry from the activities of humanitarians in the 19th Century, such as the work of Florence Nightingale and Henri Dunant, who are often held up as the first true humanitarians in the modern mould.[8]

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[6] A good summary of the post-First World War transition is provided in Michael Barnett, *Empire of humanity: a history of humanitarianism* (Ithaca: Cornell University Press, 2011), 82-94. In addition to the establishment of several new agencies, the League of Nations also discussed the prospect of a permanent International Relief Union in the late 1920s. See John F. Hutchinson, 'Disasters and the International Order II: The International Relief Union', *The International History Review* 23, no. 2 (2001).

[7] In fact, local charity was usually described as 'philanthropy' rather than humanitarianism, although there was more crossover between these terms than subsequently emerged.

[8] Dunant and Nightingale are usually considered the first true humanitarians because they emphasised the treatment of distant suffering, and Dunant in particular popularised an idea of neutrality. However Nightingale and the later Red Cross societies ended up directing aid through national institutions, contributing to the climate of militarism and patriotism in the late 19th Century. See John F.

This modern, more specific, idea of humanitarianism is the topic of this thesis: humanitarianism as a short-term activity, aiming at the relief of suffering in emergencies, which targets the whole world – regardless of nationality and politics. For all its additional clarity, however, this definition of humanitarianism leaves a lot to be desired. Over the last twenty years there has been a second era of humanitarian expansion, at least in Western Europe and America, in which the scale and extent of 'humanitarian action' has grown, and the word has been used to refer to a great deal more than the delivery of basic essentials for people in need.[9] Longer-term tasks such as state building and reconstruction have been included under the humanitarian umbrella, and the 'cluster approach' now includes not just health and nutrition, but also education and agriculture.[10] Humanitarianism has taken a significant slice of the development industry and now employs hundreds of thousands of people, spending billions of dollars each year.[11] This is without even considering the 'humanitarian interventions' and 'humanitarian bombing campaigns' that have emerged since the end of the Cold War: militaristic adaptations that are testimony to the popularity of humanitarianism and its innate flexibility, combining the aim to stop suffering with

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Hutchinson, *Champions of charity: war and the rise of the Red Cross* (Boulder: Westview Press, 1996). Their aid was primarily directed at nationals, lacking the universalist ethic that later became central to humanitarianism.

[9] Larry Minear, *The humanitarian enterprise: dilemmas and discoveries* (Bloomfield: Kumarian Press, 2002).

[10] For example, the humanitarian mission in 1990s Cambodia gradually took on the task of rebuilding the state. William Shawcross, *Deliver us from evil: warlords & peacekeepers in a world of endless conflict* (London: Bloomsbury, 2001). The more recent 'cluster approach' to humanitarian action has also included these traditional development activities.

[11] Aggregate figures from 2008 indicated around 18 billion dollars spent and 200,000 people employed in emergency relief, but depending on the definition, it could be much more. Michael Barnett and Thomas George Weiss, 'Humanitarianism: a brief history of the present', in *Humanitarianism in question: politics, power, ethics*, ed. Michael Barnett and Thomas George Weiss, (Ithaca: Cornell University Press, 2008); Craig Calhoun, 'The imperative to reduce suffering: charity, progress, and emergencies in the field of humanitarian action', in *Humanitarianism in question: politics, power, ethics*, ed. Michael Barnett and Thomas George Weiss, (Ithaca: Cornell University Press, 2008). Paul Harvey et al., *The state of the humanitarian system: assessing performance and progress* (London: ALNAP, 2010).

the means to cause suffering, and incorporating military methods into the complex contemporary humanitarian world. [12]

Defining humanitarianism

Given this diverse and contradictory history, does it make any sense to write a thesis on humanitarianism? Does 'humanitarianism' have any utility as a label at all? Certainly, some work must be done to narrow its meaning, since it can be used to describe activities as diverse as international law, medical relief, peacekeeping troops, and democratic elections. Yet beneath these diverse uses, there remain some common themes. In all its guises, humanitarianism refers to a concern for human welfare and a commitment to the alleviation of suffering, and within this, it can be used to describe an ethical stance or a concrete activity. In its ethical dimension, humanitarianism concerns a moral belief in the primacy of alleviating suffering, and, by extension, a belief in the moral worth of all humans. In its practical dimension, humanitarianism concerns the *activity* of alleviating human suffering, and has been applied at various times to most of the professions involved in such an aim.

This definition is clear enough, but two problems remain: first, the practical and ethical meanings are often conflated in both popular and academic discussion, and second, the activity of humanitarianism remains too expansive. To sharpen this definition, I propose to detach humanitarianism's practical activity from its ethical stance, and then focus on these activities in greater detail – offering what might be termed an ethnographic approach to humanitarianism, examining its concrete, micro-level practices.

[12] David Chandler, 'The road to military humanitarianism: how the human rights NGOs shaped a new humanitarian agenda', *Human Rights Quarterly* 23, no. 3 (2001); Susan Woodward, 'Humanitarian war: a new consensus?', *Disasters* 25, no. 4 (2001); Adam Roberts, 'Humanitarian war: military intervention and human rights', *International Affairs* 69, no. 3 (1993); Michael Pugh, 'Military intervention and humanitarian action: trends and issues', *Disasters* 22, no. 4 (1998).

The first step is to show that humanitarianism as moral position and humanitarianism as a concrete activity are not straightforwardly linked. It is true that humanitarian action often follows from humanitarian sentiments, but they also stand alone. On the one hand, it is quite possible to commit oneself to the humanitarian moral framework without taking part in any humanitarian action: to be a humanitarian in words, but not in deeds. This might include people we regard as cynical or hypocritical, but it also includes those with impeccable sentiments, who, for one reason or another, have not made the activity of relieving suffering part of their day-to-day life. On the other hand, it is also possible to take humanitarian action without being motivated by the underlying moral framework. The history of humanitarianism is filled with examples of intervention emerging from self-interest, national interest, or the profit motive.[13] In short, it simply does not follow that a humanitarian moral framework necessarily motivates the delivery of aid.

So it can be helpful to distinguish the ethics and practice of humanitarianism, not least because the practical dimension is poorly defined and understood. Humanitarianism as a moral idea is relatively clear and can stand adequately on its own, but defining the *activity* of humanitarianism is more problematic. For a start, the sheer quantity of professions and practices herded under its umbrella makes a sharp definition impossible. But we are also presented with a difficulty because, as argued above, moral motivation and final result remain distinct. Is 'humanitarian action' what emerges from the moral position – the product, as it were, of the noble intention? Or is 'humanitarian action' defined by the final result – the successful alleviation of

[13] A number of very vivid examples of self-interested humanitarianism can be found in Polman's recent works of journalism. Linda Polman, *War games: the story of aid and war in modern times* (London: Penguin, 2011). For a more academic description of the economic motivations for aid, see David Keen, *The benefits of famine: a political economy of famine and relief in southwestern Sudan, 1983-1989* (Princeton: Princeton University Press, 1994). One of the earliest large aid programmes, during the 1921-22 Russian famine, was designed to undermine communism and further American strategic interests, and was led by Herbert Hoover. See Bertrand Patenaude, *The big show in Bololand: the American relief expedition to Soviet Russia in the famine of 1921* (Stanford: Stanford University Press, 2002).

suffering? In my view, both these ways of defining humanitarian practice are problematic, and we should start not from the intention, nor from the result, but rather from the procedures that are followed.

If we define humanitarianism by the noble intention, we end up labelling as 'humanitarian' certain activities that are manifestly not humanitarian in their final effects. Noble intentions, after all, are no guarantee of positive results; in fact, the history of humanitarianism is littered with examples of the 'humanitarian paradox' – cases when good intentions have led to terrible consequences.[14] Perhaps the most infamous example of this took place after the 1994 Rwandan genocide, when, having failed to stop the mass killing of Tutsi citizens, international donors made a great deal of funding available for the subsequent Hutu flight over the border into Zaire. Here, in enormous refugee camps, Hutu *genocidaires* were able to regroup and launch further attacks back into Rwanda, aided by the presence of humanitarian agencies, which provided a protected space and a supply of aid that could be manipulated. Aid was not just provided in huge quantities to *genocidaires* – a thorny moral issue in itself, when the victims of the genocide had received little or no assistance – but it also enabled Hutu extremists to profit and plan further attacks. Aid itself was part of the problem, and a cause of considerable suffering.[15]

The history of humanitarianism is replete with such examples, from the simple seizure of aid by warring parties, to more complex cases when humanitarian assistance is responsible for prolonging conflict. The very existence of these

[14] Fiona Terry, *Condemned to repeat? The paradox of humanitarian action* (London: Cornell University Press, 2002).

[15] This is not to suggest that the presence of the humanitarian agencies did not assist people – for one, there was a cholera epidemic of catastrophic proportions tackled by the humanitarian agencies – it is simply to establish that the presence of aid also caused significant harm and subsequent suffering on possibly an even greater scale. See Sarah Kenyon Lischer, *Dangerous sanctuaries: refugee camps, civil war, and the dilemmas of humanitarian aid* (Ithaca: Cornell University Press, 2005); Andy Storey, 'Non-neutral humanitarianism: NGOs and the Rwanda crisis', *Development in Practice* 7, no. 4 (1997); Terry, *Condemned to repeat*; Peter Uvin, *Aiding violence: the development enterprise in Rwanda* (West Hartford: Kumarian Press, 1998).

dilemmas and paradoxes, therefore, raise crucial questions of definition. If aid causes greater suffering rather than less suffering, does it make any sense to describe it as humanitarian? Can we really describe an activity as part of humanitarianism if it actually creates *more* suffering? Such questions are vital, because if we respond, 'yes, we can', on the grounds that it is the intentions and motives of the actors that are important, we end up with a further problem: not only were these sentiments irrelevant to the final outcome, but they are also difficult to quantify. How can we declare whether an intervention is undertaken with sufficient purity of ideal, or nobility of aim? And where would we draw the line of sufficient altruism, in any case?

Since it is so impractical to bring motives into a working definition of humanitarian practice, the alternative is to define it according to the final outcome. Yet this also causes problems. First of all, it relies on an impossible calculation, in which we have to establish whether an intervention had an overall positive or negative impact before we can class it as humanitarian. Second, it appears counter-intuitive, because we may end up labelling interventions like Rwanda *not humanitarian at all* because they had no cumulative benefit, despite assistance to individuals through the provision of water, food and shelter. Finally, this definition ends up lumping together all positive interventions under the humanitarian umbrella, regardless of their often-cynical motivations. The dumping of dried milk surpluses on African nations, the distribution of supplies by warlords, the provision of aid for strategic advantage – all these would have to be described as humanitarian activities, however incidental or accidental these positive consequences really are.

If both these options leave us wanting, how *can* we define the practical dimension of humanitarianism? The answer, in my view, is to look neither at the motives (which cannot be assessed) nor at the final result (which relies on spurious

calculations of net benefit); the solution is to define the practical dimension of humanitarianism by the *methods used,* the *process* that is followed. Once we have bracketed off the word 'humanitarianism' to describe a moral belief, what is left is 'humanitarianism' as a practical activity, a set of procedures. This, more than the motives and effects, should be at the heart of our definition. Humanitarianism is a set of things that people *do*.

Humanitarianism as practice

So, what is it people do, when they engage in humanitarianism? Surprisingly, this question has barely been asked in the academic literature. In recent years, a number of ethnographic studies have emerged, but few of them consider short-term relief, and they rarely contain detailed descriptions of what takes place when international agencies arrive at a designated emergency and begin to take action.[16] Most often, academic writing brackets off these concrete activities, focusing instead on institutional politics, the moral principles of action, or the political effects of a particular intervention. It almost seems as though research on humanitarianism does not require a description of those day-to-day activities, which take place in the name of this irritatingly slippery concept. As a result, humanitarianism becomes delineated by people's self-declared intentions: it becomes a syrupy cocktail of personal ethics

[16] For an overview of the anthropology of humanitarianism see Erica Bornstein and Peter Redfield, eds., *Forces of compassion: humanitarianism between ethics and politics*, (Santa Fe: School for Advanced Research Press, 2011). Recent books in the anthropology of humanitarianism include Erica Bornstein, *Disquieting gifts: humanitarianism in New Delhi* (Stanford: Stanford University Press, 2012); Miriam Iris Ticktin, *Casualties of care: immigration and the politics of humanitarianism in France* (Berkeley: University of California Press, 2011); Didier Fassin, *Humanitarian reason: a moral history of the present* (Berkeley: University of California Press, 2012). These books demonstrate the diversity of this literature, as well as the many ways to define humanitarianism: Bornstein looks at gift relationships in New Delhi, Ticktin looks at French immigration policy, and Fassin examines a range of topics, from AIDS to refugee camps.

and barely-defined practice, which leads to the profusion of dilemmas and paradoxes mentioned above.

My proposal in this thesis is that humanitarian action should be more clearly delimited by its activities – activities that, if the word is to have any meaning, must aim directly at the alleviation of suffering and prevention of death. For the most part, this means the provision of basic essentials such as water, food, and shelter where they are sorely needed. These three things, which are absolute pre-requisites for life to continue and suffering to stop, are at the heart of all humanitarian programmes, and can be traced through history, forming the bedrock of relief programmes from Bengal, Biafra and Bosnia. The delivery of these essentials are also immediately tangible – they can be seen, felt, experienced and evidenced in various ways, especially since they entail the provision of *material* objects, *physical* things, such as the foodstuffs themselves, the tents, blankets and water. Whereas the purity of motivation cannot be uncovered, and the final outcome of interventions cannot be predicted, humanitarianism as a *practice* focuses our attention on the observable operations of aid.

This way of conceiving humanitarianism also has the advantage of delineating, in a straightforward way, the boundaries of a study. Humanitarianism involves the provision of basic essentials, but not only that; humanitarianism involves the provision of basic essentials *using certain procedures*. Over the past half-century, humanitarianism has become an extremely technocratic industry, regulated by guidelines, policy documents, and distinct areas of expertise.[17] For example, the delivery of food aid adheres to a common template, including the measurement of

[17] For a sense of the current state of standardised, professionalised humanitarianism, see the handbooks that emerged in the last twenty years, which delineate in astounding detail how to implement a humanitarian response. Perhaps the most detailed is the Sphere project, which is now in its third edition. In chapter two I look at the implementation of this kind of humanitarian intervention in South Sudan. Sphere Project, *Humanitarian Charter and Minimum Standards in Disaster Response* (Oxford: Oxfam Publishing, 2000); Humanitarian Accountability Project, *The guide to the HAP standard: humanitarian accountability and quality management* (Oxford: Oxfam, 2008).

individual bodies, the surveying of the population, and the efficient provision of nutritionally-balanced meals; the provision of water is packaged up with the organisation of space, the development of sanitation systems, and the communication of hygiene rules; the establishment of emergency shelter follows guidelines stipulating the layout, dimensions, and structure of dwellings. Today, humanitarianism is best defined as a discrete set of practices in these key areas, which have become increasingly standardised in recent years.

We can now begin to see why it makes sense to label the Rwanda intervention as 'humanitarian', despite our inability to test motives and its often catastrophic effects: it is humanitarian because it involved a particular set of practices, and followed a particular model for action; it is humanitarian because it involved the provision of basic essentials, according to common procedures. We can also see why it makes little sense to label as 'humanitarian' the wars and bombing campaigns that have increasingly adopted this label since the end of the Cold War: the reason is *not* because the motives are tainted (after all, the intentions are often noble), nor because the effects are bad (after all, the effects are sometimes good), but rather because the *methods do not qualify*.[18] These are not humanitarian actions as I define it because they fail to follow the well-established and increasingly standardised processes of humanitarian action. They are *military* actions because they use *military* processes, utilising methods of destruction, rather than assistance.

This study, therefore, defines humanitarianism as a set of practices, focused on short-term needs, acting with a global reach, and following international procedures for the provision of certain items. In defining humanitarianism in this way, I cast an ethnographic gaze on the world of institutionalised humanitarianism, and in so doing,

[18] On the noble motives behind militarised humanitarianism, see Michael Ignatieff and Bernard Kouchner, who argue their position with impeccable humanitarian sentiments. Michael Ignatieff, *Empire lite: nation-building in Bosnia, Kosovo and Afghanistan* (London: Vintage, 2003). On the positive results of militarised humanitarian interventions, consider the Sierra Leone mission in 2000.

contribute to a growing body of work on the anthropology of aid. By concentrating on its micro-level manifestations, this thesis can be read alongside the work of Miriam Ticktin, Didier Fassin, Peter Redfield, Ilana Feldman, and Erica Bornstein, who have looked at humanitarianism in practice, from the suburbs of New Delhi to the detention centres of France.[19] Yet this thesis is distinct from these authors in at least three respects. First, it adds a historical perspective, looking not just at micro-level practices, but also at the context from which they emerged. Second, it draws on Science and Technology Studies (STS), examining not just the human element of humanitarian practice, but the way these are embedded in material objects. Third, it examines nutrition, focusing on a single thematic area of humanitarian aid. In the rest of this introduction, I summarise these elements of the thesis in reverse order, beginning with its thematic focus: the attention to nutritional expertise.

A focus on nutrition

The provision of food is a central pillar of the humanitarian endeavour. It fulfils a key human need, along with shelter, water, and sanitation, and is one of the first preoccupations of aid agencies when responding to a new emergency. In recent years, humanitarian nutrition, like other core areas of short-term emergency response, has undergone a remarkable degree of standardisation: nutritional programmes take similar forms across the world, with the same foods, the same assessments, and the same structure; they are also governed by international guidelines, issued by the World Health Organization, the World Food Programme, and the Sphere project.[20] To

[19] Bornstein, *Disquieting gifts: humanitarianism in New Delhi*; Ticktin, *Casualties of care: immigration and the politics of humanitarianism in France*; Ilana Feldman, 'The humanitarian circuit: relief work, development assistance and CARE in Gaza, 1955-67', in *Forces of compassion: humanitarianism between ethics and politics*, ed. Erica Bornstein and Peter Redfield, (Santa Fe: SAR, 2010); Fassin, *Humanitarian reason: a moral history of the present*.
[20] Sphere Project, *Humanitarian Charter and Minimum Standards in Disaster Response* (Geneva: Sphere Project, 2004); World Health Organization, *The management of nutrition in major emergencies*

the extent that these handbooks share a common approach, humanitarian nutrition – its theoretical basis, its practices and structure – can be analysed as a coherent project, representing a historically specific approach to hunger and food.

In this approach, hunger is defined by bodily measures: to determine whether someone is malnourished, dimensions such as the height and arm circumference are taken, and compared to what is 'normal'. Based on this assessment, people are then admitted to a feeding programme. The foods distributed in this programme are defined by nutritional value: the food itself is merely a vehicle for the nutrients they contain, and humanitarians seek to provide the perfect balance to sustain the human body. In this thesis, I focus on these two facets of humanitarian practice: *the measurement of hunger*, and *the provision of food*. I describe how hunger, which until the 20th Century had never really been quantified, has become defined as a physical phenomenon, objectively measureable on the external body. I explore how food, which was long understood through its social utility, has become *re*defined as an assemblage of nutrients, amenable to manipulation by food technologists. The focus of this thesis can be summarised in four words: defining hunger, redefining food. This is the story of humanitarian nutrition.

Much of this story concerns the ideology of *nutritionism*, in which food, and all the social processes surrounding it, has been reduced to an interaction between nutrients and the physical body.[21] It may seem rather expansive to label this as an ideology, but as Gyorgy Scrinis has explained, it has a profound effect on many aspects of the contemporary world:

(Geneva: World Health Organization, 2000); Save the Children Fund, *Emergency nutrition assessment: guidelines for field workers* (London: Save the Children Fund, 2004); World Food Programme, *Food and nutrition handbook* (Rome: WFP, 2001).

[21] Gyorgy Scrinis, 'Nutritionism and functional foods', in *The philosophy of food*, ed. David Kaplan, (Berkeley: University of California Press, 2012); Gyorgy Scrinis, *Nutritionism: the science and politics of dietary advice* (New York: Columbia University Press, 2013); Michael Pollan, *In defence of food: the myth of nutrition and the pleasures of eating* (London: Penguin, 2009).

> [It] has framed popular dietary advice and dietary guidelines, food and nutrition policies, food manufacturing and marketing practices, food labelling regulations, and the public understanding of food and dietary health. Nutritionism not only underpins the scientific knowledge informing the production of nutritionally modified foods, but has also shaped the consumer demand for and acceptance of these products and their associated health claims through the production of nutricentric persons who understand and engage with food in these ways.[22]

Nutritionism has also affected our mealtimes, our consumption decisions, and the way we bring up our children. It has affected our agricultural practices, and has a knock-on effect on international trade, commodity markets, and livelihoods. These effects spring from three foundational principles of nutritionism: (1) that nutrients are more important than foods, (2) that foods are primarily important for health, and (3) that our diet is amenable to technical intervention, to be processed and altered for greater efficiency. To criticise this perspective of food is not to reject biochemical knowledge, or to deny the role of nutrients for bodily functioning; rather, it is to highlight the dominance of such a vision. It is a vision that, to use the words of Gyorgy Scrinis again, 'tends to undermine, displace, and even contradict other ways of understanding and contextualising the relationship between food and the body'.[23]

There has been an explosion of literature on food in recent years and a number of mass-market books – most notably by Michael Pollan – which critique the dominant approach of nutritionism, yet few have concerned humanitarian relief.[24] In this thesis I argue that the reduction of food to nutrients has not just affected the rich world, with its processed diets, industrial production, and obsession with health; it has also led to a restricted understanding of human needs, which sees an absence in

[22] Scrinis, 'Nutritionism and functional foods', 270.
[23] 'Nutritionism and functional foods', 271.
[24] Raj Patel, *Stuffed and starved: markets, power and the hidden battle for the world food system* (London: Portobello, 2007); Pollan, *In defence of food: the myth of nutrition and the pleasures of eating*; Marion Nestle, *Food politics: how the food industry influences nutrition and health* (Berkeley: University of California Press, 2002).

nutrients, rather than foods, as the key problem in disasters. This has placed more control in the hands of experts, who calculate the value of foods through their invisible biochemical components. It has led to more technocratic approaches for tackling hunger, in which hunger has been reconceived through the ideology of nutritionism: rather than being a subjective experience and a social problem, it has become purely corporeal, taking place in the body and measurable by an external gaze. These characteristics are embodied in the tools used by humanitarian workers: the anthropometric instruments, through which hunger is measured, and the emergency foods, through which starvation is averted. Such objects, which are laden with importance, are central to the practices of aid, and are the focus of the present study.

A focus on objects

In humanitarian situations, every object is prized. Most commodities are lacking, from grain to soap, buckets to plastic sheeting, and obtaining and distributing these objects becomes the most central activity of relief. Humanitarianism involves providing basic essentials such as food, healthcare, shelter and water, but this requires a host of related objects: jerrycans and pumps to deliver the water, poles and tarpaulin to build the shelter, sacks and warehouses to store the food, to say nothing of the foodstuffs, the shelter and the water themselves. These tangible, material things are at the heart of humanitarian action, and are the main preoccupation of aid agencies. In studying humanitarian practice, therefore, we must focus on objects themselves – those seemingly mundane items that exist at the very centre of any intervention. Especially in the early stages of an emergency, providing scarce objects is a central part of what humanitarians do.

This material element of relief remains relatively neglected in the academic literature: scholarly work tends not to consider what is provided in disaster, how, why, and with which effects. This level of detail is considered mainly in operational guidelines or policy papers, and, with the exception of some recent work by Peter Redfield, there have been no detailed academic analyses of humanitarian objects. [25] It is not easy to explain this scholarly disregard for the material elements of relief. Perhaps humanitarian objects are seen to be too obvious and everyday to justify any detailed analysis. Perhaps they are seen as passive, inert features of the world, with little effect on the human drama of emergencies. Perhaps they have been parcelled off as the preserve of the natural scientist – part of the academic division of labour that leaves the humanities and social sciences with the task of examining purely *human* phenomena.[26] Whatever the explanation, this thesis argues that *objects matter*, and in studying humanitarianism, especially when studying humanitarian practice, we need to account for the central importance of the material world.

At one level, this is relatively obvious: humanitarian organisations are involved in providing food, water, and shelter to people in need, and if humanitarian action is to mean anything, it must involve the distribution of things. But at another level, this springs from a foundational theoretical commitment, which is best described as *radical non-modernism*. This theory, which emerges from Science and Technology Studies (STS) and particularly the work of Bruno Latour, holds that the cause of any change in the world must be attributed to an alliance of both people and things. It suggests that we cannot consider human life in isolation from the lives of

[25] Peter Redfield, 'Vital mobility and the humanitarian kit', in *Biosecurity interventions: global health & security in question*, ed. Andrew Lakoff and Stephen Collier, (New York: Columbia University Press, 2008); Peter Redfield, 'Bioexpectations: Life Technologies as Humanitarian Goods', *Public Culture* 24, no. 1 (2012).

[26] In the existing humanitarian literature, discussion of humanitarian objects is restricted to technical and scientific publications (see for example, the early volumes of the journal *Disasters*). This left the social studies of humanitarianism with a remit of purely human activity, societal relationships, and moral ideas.

objects, and we cannot consider the material world in isolation from society. Humans and objects influence each other in multiple ways, and they cannot be examined separately. In fact, radical non-modernism suggests that the relationship between humans and things is so deep-seated that it makes no sense to divide the world into social and natural realms at all. Everything is a hybrid, a complex mixture of human and material elements, and the purification of 'natural' from 'social' tends to obscure rather than clarify academic analysis.[27]

A non-modernist approach to humanitarian action pays detailed attention to these hybrid objects, asking: how are they created? How are they used? What roles do they play? What effects are produced? Humanitarianism is filled with such hybridity. Take a packet of 'emergency food', for example – an object like the BP-5, which is a large, fortified biscuit, wrapped in silver foil. In the BP-5, all the nutrients for the 'short-term maintenance of a healthy body' are packed into a tablet: a durable, portable, lightweight meal. This object is designed in the West, and distributed in crisis zones the world over. It builds on decades of food technology and nutritional knowledge, rooted in political disputes about human needs. It is given to distraught families in social and political flux, and its form replaces communal eating with the fulfilment of purely biological needs. The BP-5 is more than just an object, therefore: it is a site where science and society interact. It stands in networks of material and social relationships, connecting scientific discovery with social history, intellectual trends with cultural practices. It defines what it means to take humanitarian action, as well as what humanitarianism can achieve.

The non-modernist perspective on humanitarian action offers a challenge to the two most dominant frameworks for understanding emergency relief. On the one hand, it confronts the technical literature, which sees humanitarianism as a problem of

[27] For the most famous articulation of this approach, see Bruno Latour, *We have never been modern* (Cambridge: Harvard University Press, 1993).

engineering. According to this view, human needs can be quantified and objectively known, material goods can be provided according to an established template, and technological progress facilitates ever-more efficient relief. Humanitarianism, in this view, is the application of science to reduce short-term suffering. For the logisticians and engineers who plan refugee camps and establish systems for providing food, humanitarian problems are amenable to an objective, technocratic response.

On the other hand, the non-modernist perspective confronts a sociological literature, which reduces humanitarianism to power struggles. A vibrant critique of humanitarian action has emerged over the past two decades, which looks at how aid is inserted into global governance. Humanitarianism, in this perspective, is a mechanism for policing and governing populations in distant lands; it is shaped by the policies of the great powers, which manipulate funding to direct aid towards their geopolitical concerns.[28] These critiques draw attention to how humanitarianism involves *more* than just the relief of suffering with scientific means, how it plays considerable political roles, specifically in conflict management. It also examines the discourse of aid, looking beyond politics to the structure of language and its power effects, arguing that aid manages people and shapes human conduct.[29]

The problem with both these views is that they are incomplete. It makes little sense to reduce humanitarian action to an objective, scientific process, since it is implemented in cultural contexts, and it has considerable socio-political effects. There can be no objective, technical fix to humanitarian problems because – as authors such as Alex De Waal and David Keen have pointed out – aid is embroiled in socio-

[28] Mark Duffield, *Development, security and unending war: governing the world of peoples* (Cambridge: Polity, 2007); Jennifer Hyndman, *Managing displacement: refugees and the politics of humanitarianism* (Minneapolis: University of Minnesota Press, 2000); Jenny Edkins, *Whose hunger? Concepts of famine, practices of aid* (Minneapolis: University of Minnesota Press, 2000).
[29] David Campbell, 'Why fight: humanitarianism, principles, and post-structuralism', *Millennium: Journal of International Studies* 27, no. 3 (1998); Jenny Edkins, 'Humanitarianism, humanity, human', *Journal of Human Rights* 2, no. 2 (2003).

political realities, affecting institutions and economies profoundly.[30] Yet it is equally absurd to reduce humanitarian action to politics, power plays, and discourse: humanitarianism is irreducibly material, and in concentrating on power and government, the sociological literature misses the concrete achievements of life-saving relief. In other words, the sociological literature is too concerned with power, neglecting the materiality of suffering, and the technical literature is too concerned with things, ignoring the political and social components of aid. These two extremes are to some extent caricatures, but they highlight the need to appreciate the material *and* social aspects of humanitarianism, finding a way that does not reduce it to objective science on the one hand, or power and discourse on the other.

A non-modernist approach suggests that humanitarianism does not just apply scientific knowledge to keep humans alive, but neither is it the simple application of power to discipline bodies and govern populations. Humanitarianism is not purely social, pure power and control, pure government; it involves matters of life and death, pain and suffering, objects and places. But at the same time humanitarianism is not purely objective and material, reducible to science with no social content, since it involves cultural and historical constructions about what humans need, and is embroiled in political and social disputes. To put it in Latour's terms, humanitarianism is simultaneously *material* (as it concerns physical objects), *narrated* (as it is captured in documents), and *collective* (because it relies on people and their politics). In this study, with its focus on nutrition, I illuminate this complexity through objects: the *measuring instruments*, which make hunger visible, and the *emergency foods*, which provide nutrients for the human body.

[30] Keen, *The benefits of famine*; Alex De Waal, *Famine crimes: politics and the disaster relief industry in Africa* (Oxford: James Currey, 1997).

A focus on history

So this thesis looks at the *practice* of humanitarianism, it focuses on nutrition, and it examines this through objects, particularly emergency foods and anthropometric measuring tools. But its other defining feature is historical. This thesis draws largely on archival documents, past periodicals, and oral sources, which are used to create a particular kind of history: a history of the present.

Histories of the present examine the past in order to shed light on the present. They use history to understand the contemporary world. The aim is to 'destabilise the present', to show how existing ways of doing things are far from inevitable. Starting with some contemporary phenomena, histories of the present look at the past *to see how these practices emerged. F*ar from presenting a teleological view of history – a culminating narrative, in which a linear development is traced from the past to the present – they highlight the differences of the past, the shifts in patterns of thought, and the way our current ways of living are not in any way necessary. Rather than examining a tightly defined historical era in its own terms, this approach emerges from historical sociology, and examines long-term patterns of transformation, studying how social phenomena emerge and change.[31]

This thesis takes the world of nutritional relief, and explores how it came to be. It is an intellectual history and material history: it explores the intellectual currents from which humanitarianism emerged, and their development into concrete practices, implemented on battlefields, in natural disasters, and amongst the temporary shelters of refugee camps. In the following narrative, this story will be told through objects. As I have argued, material supplies are essential to relief, so a history of humanitarian

[31] Whereas the discipline of history examines specific periods of the past, and the discipline of sociology examines the nature of society in the present, historical sociology combines these concerns, analysing how history shapes society, and how social phenomena emerge and change. See Craig Calhoun, 'Afterword: why historical sociology?', in *Handbook of historical sociology*, ed. Gerard Delanty and Engin Isin, (London: Sage, 2003).

nutrition must also be a history of objects. This is a history of new foods, from leaf protein to therapeutic formulae, desiccated hog's stomach to fishmeal biscuits. It is the story of measuring instruments, from nutritional requirements to anthropometric tools, skinfold callipers to mid-arm circumference tapes. These objects are where intellectual currents, social relationships, and political ideologies converge, where science meets society, and society, science. This thesis recounts the diverse, fascinating and colourful histories of such objects, bringing them to life, and showing how they act on us and shape our world profoundly.

Until now, there have been relatively few histories of humanitarianism. There are a number of histories of major aid agencies, including books on UNHCR, Oxfam, the Red Cross and Save the Children, and studies of aid in specific crises, including the Franco-Prussian War, the Russian Famine, and World War Two.[32] These studies, however, tend to be localised: they examine a narrow historical period, a defined geographical area, or single institutional actor. They tend not address the wider reach of humanitarianism: its moral ideals, its common practices, its global reach, its ideological dominance, and the way it has evolved over the 150 years of its modern existence. Such long-term, cultural histories exist for the related topics of human rights and development, but the only study that comes close for humanitarianism is Michael Barnett's *Empire of Humanity*: the only single-volume history of humanitarianism writ large.[33]

[32] On the major aid agencies, see Gil Loescher, *The UNHCR and world politics: a perilous path* (Oxford: Oxford University Press, 2001); Maggie Black, *A cause for our times: Oxfam, the first 50 years* (Oxford: Oxford University Press, 1992); Linda Mahood, *Feminism and voluntary action: Eglantyne Jebb and Save the Children, 1876-1928* (London: Palgrave Macmillan, 2009); Hutchinson, *Champions of charity*. On some key crises, see Bertrand Taithe, 'The Red Cross flag in the Franco-Prussian war: civilians, humanitarians and war in the 'modern age'', in *War, medicine and modernity*, ed. Roger Cooter, Mark Harrison, and Steve Sturdy, (Stroud: Sutton, 1998); Patenaude, *The big show in Bololand*; Jessica Reinisch, 'Internationalism in Relief: The Birth (and Death) of UNRRA', *Past & Present* 210, no. 6 (2011).
[33] Barnett, *Empire of humanity*.

Barnett provides an excellent overview of humanitarian action, encompassing the main trends, institutions, and political crises. His book has a wide scope, situating the sector in societal changes, encapsulated in three different eras: 'imperial humanitarianism', 'neo-humanitarianism', and 'liberal humanitarianism'. As a scholar of international relations, he concentrates on institutional policy, interstate relations, and global trends, filling a gap that was left by the primarily localised studies of aid that had preceded him. Yet Barnett's book tends to ignore ground level practice. It is a useful resource for the story of institutional politics, but it largely neglects the details of relief: the questions of what people actually did when they travelled across the world and took action to relieve suffering in disaster. This reflects a general trend in the literature. Despite the close associations between anthropology and cultural history in recent years, there has not been an 'ethnographic turn' to humanitarian history. There are still very few studies of the practices used, the people involved, and the day-to-day operations of relief.[34]

So what *did* humanitarians do in the past? How do we know? In this thesis I focus on a number of primary sources: correspondence to and from the field, scientific journal articles, memoirs of aid workers, newspapers, policy documents, and the practical guidelines issued by aid agencies. In attending to the practical dimension of humanitarian nutrition, I also draw on a separate body of work on history of nutrition. This growing field encompasses excellent cultural histories of food and hunger, explaining many of the scientific and technological discoveries that underpinned nutritional intervention in the 20th Century. In telling of what

[34] The notable exceptions, which do not explicitly articulated as studies of humanitarianism, but which take this approach, include a number of studies on relief after World War Two. Gerald Daniel Cohen, 'Between relief and politics: refugee humanitarianism in occupied Germany 1945-1946', *Journal of Contemporary History* 43, no. 3 (2008); Atina Grossmann, 'Grams, Calories, and Food: Languages of Victimization, Entitlement, and Human Rights in Occupied Germany, 1945–1949', *Central European History* 44, no. 1 (2011); Jessica Reinisch, ''We Shall Rebuild Anew a Powerful Nation': UNRRA, Internationalism and National Reconstruction in Poland', *Journal of Contemporary History* 43, no. 3 (2008).

humanitarianism did, therefore, we must move beyond humanitarian histories, and look at the literature covering the technical fields that make up the daily practice of aid. The contribution of this thesis is to bridge the gap between these two realms: between nutritional histories, which neglect the story of emergency relief, and humanitarian histories, which neglect the micro-level practices found in nutritional interventions.

The third gap is theory. Histories of aid seem reluctant to draw on theory to understand relief and its origins, and Barnett's book is no exception. He identified a series of 'enduring tensions', 'contradictory elements' in the history of humanitarianism, each of which cried out for deeper theoretical analysis. Humanitarian action, he argued, was characterised by paternalism *and* emancipation, by care *and* control. He argued that humanitarian ethics were universal *and* contextual: they were cultural products of a particular age, but they contributed to a growing acceptance of universal ideals. To make things more confusing, his discussion moved back and forth between a contradictory discussion of empirical trends and normative positions. He argued that humanitarian ethics were circumstantial, before citing them as evidence of moral progress. He endorsed humanitarianism as a project of emancipation, but then presented the paternalistic elements of aid as somehow necessary.[35] All this left the reader longing for some surer ground, some theoretical coherence or evaluation of systematic perspectives on the history of relief. But Barnett remained coy about using theory to sort through the mess: 'the only -ism I care about', he wrote in the introduction, 'is humanitarianism'.

Theory has many uses in a history of aid. For one thing, it can generate an overarching narrative. A Foucauldian approach, for example, fits humanitarianism into changing technologies of power and rule, linking disparate events with a theme

[35] Sometimes the world needs a 'good dose of paternalism', he suggested, because 'a world without paternalism might be a world without an ethics of care'. Barnett, *Empire of humanity*, 12.

of governance.[36] Theory can also help explain events. Thomas Haskell's work, for example, gives a bold account of the sudden rise in humanitarian sensibilities, attributing them to the market and the rise of capitalism.[37] At a different level, theory can help draw together some of the cumulative effects of aid. Certain Marxist approaches, for example, see humanitarianism as a mechanism of social control, a bourgeois tool for stifling class conflict, maintaining stability, and generating norms of acceptable behaviour.[38] Finally, theory can help us situate the political position of relief agencies in a wider field. Liberalism and cosmopolitanism, for example, identify humanitarianism not just as a moral act motivated by a minimalist desire to save lives, but as part of a wider commitment to matters of justice.[39]

Many of these theoretical perspectives can be found in related areas of historical research – studies of Victorian philanthropy, for example, the anti-slavery movement, or colonial civilizing missions – but they are strangely absent in the study of humanitarianism, particularly when defined as a short-term project with a global reach, directed at the provision of basic essentials. There is something about the political simplicity and ethical force of this endeavour that makes scholars reluctant to employ theoretical tools, perhaps because they require holding humanitarianism at arms length, and viewing it sceptically. Even those scholars that come close, such as Barnett and Peter Redfield, feel the need to constantly remind the reader of their

[36] For an idea of Foucauldian histories of humanitarianism, see Mark Duffield, 'Risk-Management and the Fortified Aid Compound: Everyday Life in Post-Interventionary Society', *Journal of Intervention and Statebuilding* 4, no. 4 (2010).
[37] Haskell, 'Capitalism and the origins of humanitarian sensibility, part one'; Thomas Haskell, 'Capitalism and the origins of humanitarian sensibility, part two', *American Historical Review* 90, no. 3 (1985).
[38] Gareth Stedman Jones, *Outcast London: a study in the relationship between classes in Victorian society* (Oxford: Clarendon Press, 1971).
[39] Humanitarianism, after all, is a component of contemporary liberalism, which values rights and global social safety net. It resonates particularly with the ideas of Henry Shue, *Basic rights: subsistence, affluence, and U.S. foreign policy* (Princeton: Princeton University Press, 1996); John Rawls, *A theory of justice* (Oxford: Clarendon Press, 1972).

sympathy with the humanitarian cause, as though there was something wrong with criticising humanitarianism without such provisos.[40]

Structure

Nutrition, objects, and history – these are the focus of this thesis, informing the structure that follows. Part I contains preliminaries, considering each of these areas in turn. Parts II and III then contain the heart of the historical research, examining, respectively, the techniques employed for feeding bodies and measuring hunger.

Chapter two returns to nutrition. Based on fieldwork in South Sudan, it describes how food is delivered in contemporary aid, providing a snapshot of a recent emergency. It begins by describing anthropometry, where women and children are measured to assess their nutritional status, and then describes 'supplementary feeding', where fortified cereals are distributed to complement the diet. It ends by describing therapeutic care, where packets of peanut paste are provided to the dangerously malnourished. In line with a 'history of the present', this chapter shows how humanitarianism *is*, before we look at how it *became* that way.

Chapter three returns to objects. This is a theoretical chapter, justifying my approach, and exploring how the material and social worlds interact. It begins with the work of Bruno Latour, explaining his ontological and epistemological positions, and then moves to the idea of non-modernism, which forms the basis of my approach in this thesis. This discussion of theory then turns to historical methods, providing an overview of my sources and methodology. This part of the chapter finds common

[40] Michael Barnett, for example, writes that he fell in love with his subject and wished he could be more like the humanitarians he studied, and Redfield's introduction states (rather unnecessarily) 'like most potential readers of this book, I too care about the lives of others'. Barnett, *Empire of humanity*, x; Peter Redfield, *Life in crisis: the ethical journey of Doctors without Borders* (London: University of California Press, 2013), 6.

ground between Latourian non-modernism and more traditional historical methods, showing how documentary analysis can be used to write a history of humanitarian nutrition with a focus on objects. Combined with the previous chapters, this constitutes Part I of the thesis: a detailed discussion of thematic focus and theoretical underpinnings, preliminaries to the historical material.

Part II is where this historical material begins. Entitled 'Providing for the Body', it examines how humanitarians have fed people, studying the history of emergency foods, such as Plumpy'nut, a sweetened peanut paste. In this section of the thesis, I document how humanitarian feeding has changed in the twentieth century, from being concerned with practicalities (such as the durability and portability of rations), to being concerned with nutritional balance (providing the correct intake of nutrients). It also describes the search for humanitarian 'wonder-products', in which foods were developed from algae, petroleum, and protein hydrolysates.

Chapter four examines the effect of military practices on the provision of emergency foods. In the 20th Century, food began to be judged by its biochemical properties rather than its socio-cultural roles. It was rated according to its contribution to efficiency and strength, and the choice of emergency rations became dictated by energy content, durability, and compactness. Drawing on relief worker memoirs, post-war humanitarian handbooks, and archival documents, this chapter argues that relief in the 1930s and 1940s was preoccupied with order, efficiency and mobility. Humanitarianism drew on military practices and was preoccupied with control – features that continue to shape relief.

Chapter five looks at the effect of high modernism. This reached its high point in the 1950s and 1960s; a period where emergency foods moved beyond the purely functional form of military rations, and began to be tweaked using advanced technological processes. It was a period in which high protein biscuits were made

from proteins extracted from fish and plants, where petroleum was seen to contain the solution to global food shortages. It was a period where fortified flours were developed to replace breast milk, and science seemed to offer a bright new future for humankind. This chapter argues that the 1950s and 1960s were dominated by radically modernist conceptions of food, which tried to tame nature, increase the efficiency of foods, and discard 'irrational' cultural practices. Again, the chapter suggests that these characteristics have not gone away, but can still be found in operations of relief.

Chapter six then traces the role of commerce. It develops the idea of 'commerciogenic malnutrition', in which malnutrition and commerce became locked in a symbiotic relationship. It begins with a description of the economy of dried milk surpluses, which generated the market for fortified flours, and ends with the main commodities in emergency feeding programmes: corn, soya and wheat, which are the most important crops in our globalised food system. This chapter argues that a commercial mentality has long been present in humanitarian relief: private companies have promoted new foods to aid agencies and the poor, often manufacturing them from the cheap, readily available residues of other industrial processes.

Part III moves from the history of food to the history of hunger. Entitled 'Making Hunger Visible', this part of the thesis examines how humanitarians have assessed starvation over the past century. It is a study of the anthropometric techniques used to measure malnourishment, which require tools like the 'MUAC Band': a strip of colourful tape, which is wrapped around the bicep of young children to measure their wasting. I describe how measurements of malnourishment have changed in the twentieth century, moving from community surveys, which documented what people eat, to bodily measures, which quantified changes to their physique. The implications of this shift are profound: reducing hunger to a

biochemical process, judging its results rather than its causes, and silencing local perspectives. The two chapters in this section look at the intellectual underpinnings to nutritional anthropometry.

Chapter seven looks at the role of specifics. It examines the medicalization of hunger in the 1940s and 50s, when hunger became the object of medical expertise. This chapter considers the disaggregation of hunger, and the accumulation of detail on the physiological impact of starvation. Starvation was broken down into a complex typology, transformed into a bewildering variety of deficiency diseases; accompanying this was an intense interest in the precise anatomical manifestations of starvation, and a gruesome series of experiments into the minutiae of the deteriorating body. Through these changes, hunger was reduced to a biochemical deficiency, and anthropometry could emerge as a way to make visible what could not otherwise be seen. The body's underlying biochemical condition became 'true' malnourishment, and anthropometry became the most scientific way to reveal this condition in the resource-poor circumstances of a humanitarian emergency

Chapter eight looks at the role of statistics in facilitating anthropometry. It suggests that anthropometry would be impossible without ideas of universality (the notion that all humans are fundamentally the same, so their bodies can be compared), and normality (the notion that there is a statically normal body that forms the basis for this comparison). By pointing out that universality and normality were historically conditioned, this chapter argues that far from being a neutral and impartial application of science to measure hunger, anthropometry actively creates the terms within which malnourishment is defined. By relying on the measurements of a healthy 'reference population', this seemingly objective system of measurement contains embedded assumptions about what constitutes a good way to live.

Central arguments

This thesis has five overlapping arguments.[41] First, there is a political argument. I argue that humanitarian action is always political, and that it is impossible to adhere to 'classical' humanitarian principles such as neutrality, impartiality and independence. This speaks to an already vibrant debate in the literature, which tends to focus around the desirability of these principles, with one side suggesting that they represent a moral response to suffering, and the other arguing that they are amoral – preventing humanitarians from distinguishing between perpetrator and victim.[42] My contribution is not to enter this ethical debate, but to point out how these principles are based on a fiction. Drawing on Latour's non-modernism, I argue it is impossible to separate science from society, highlighting a number of ways in which politics enters into seemingly objective humanitarian procedures.

Second, I make a sociological argument: I claim that the micro-level practices of humanitarian nutrition have been shaped by a number of themes, all of which are associated with modernity. In part II, I look at *militarism*, *modernity*, and *markets*, arguing that each shaped the character of emergency food. In part III, I look at the power of *specifics* and the power of *statistics*, arguing that these were the intellectual pre-requisites for nutritional anthropometry. Collectively, these themes constitute an idea of humanitarianism as 'persistently modern' – a notion I expand in the

[41] These arguments can be found in more detail in the conclusion to this thesis.
[42] For an overview of these principles and the debate surrounding them, see Thomas Weiss, 'Principles, politics, and humanitarian action', *Ethics & International Affairs* 13, no. 1 (1999); Richard Black, 'Ethical codes in humanitarian emergencies: From practice to research?', *Disasters* 27, no. 2 (2003); Marion Harroff-Tavel, 'Neutrality and Impartiality? The importance of these principles for the International Red Cross and Red Crescent Movement and the difficulties involved in applying them', *International Review of the Red Cross* 29, no. 273 (1989); Nicholas Leader, 'Proliferating principles; Or how to sup with the devil without getting eaten', *Disasters* 22, no. 4 (1998); Joanna Macrae, 'The death of humanitarianism? An anatomy of the attack', *Disasters* 22, no. 4 (1998); Larry Minear, 'The theory and practice of neutrality: some thoughts on the tensions', *International Review of the Red Cross* 81, no. 833 (1999); Denise Plattner, 'ICRC neutrality and neutrality in humanitarian assistance', *International Review of the Red Cross* 36, no. 311 (1996); Hugo Slim, 'Relief agencies and moral standing in war: principles of humanity, neutrality, impartiality and solidarity', *Development in Practice* 7, no. 4 (1997).

conclusion. In other words, these themes have not only affected humanitarianism in the past, but also they continue to shape humanitarianism in the present. This ties in with my first argument, because 'classical' humanitarians like to define humanitarianism *against* the military, or *against* the markets, but in reality the aid industry draws from these realms, and cannot be isolated from them.

Third, I make a historical argument: I suggest that the main features of humanitarian nutrition were formed in the middle of the twentieth century, between the early 1930s and the mid-1970s. Taking the Biafran war as a turning point, I suggest that the modern humanitarian regime was well established by the late 1960s, from the reliance on fortified flours to the use of anthropometric measurements. This argument speaks to the historical literature on human rights, suggesting that humanitarianism was professionalised and standardised before the 1970s (which has been identified as the crucial turning point in the institutionalisation of human rights).[43] In other words, humanitarianism was an early, rather than a late, adopter of the professional, individualising practices that affected the human rights movement in the 1970s. The modern form of humanitarian relief, I argue, emerged from the ruins of the Second World War, was established in the 1960s, and was largely standardised by the end of the Biafran war.

Fourth, I make a theoretical argument. I argue that the changes that took place in the middle of the twentieth century have transformed the way we understand hunger and food. The influences of modernism, the military, and the market have not just shaped what humanitarians do in practical terms; it has also shaped the objects they use. This theoretical, ontological argument is drawn from Latour, who suggests that objects are defined by their relations. What hunger is, and what food is, in other

[43] Samuel Moyn, *The last utopia: human rights in history* (Cambridge: Harvard University Press, 2010), 1-13; Stephen Hopgood, *The Endtimes of Human Rights* (London: Cornell University Press, 2013), preface.

words, are determined by what they are connected to. As I explain in chapter three, this is not the same thing as tracing changing *perceptions* of hunger and food. What food *was* changed in the twentieth century; what hunger *was* also changed. This is captured in the title: *Defining Hunger, Redefining Food*. The nature of these things was transformed. During the 20th Century, hunger became defined as a physical experience, and food redefined as an assemblage of nutrients.

Finally, I make a normative argument. Whilst recognising the achievements of the humanitarian system, I also find many faults with it. This, it should be clarified, is *not* a critique of the simple, noble act of sharing food when people are in need: it is a critique of the way food is provided in the institutionalised world of contemporary humanitarianism. Ultimately, my argument comes down to this: that the transformation of food into nutrients has not benefited the starving. It places control in the hands of experts, who calculate the value of foods in way that are unfamiliar; it takes power away from recipients, especially when they are not enabled to acquire and eat the foods they are used to; it objectifies people, silencing them and identifying hunger in a purely physical way; it relies on problematic constructions of normality, which contain embedded value judgements about the right way to live. In short, the problem with humanitarian nutrition is that it has depoliticised hunger, transforming it into a technical intervention. It responds to starvation by extracting its political content, whilst failing to address the unequal structures that have caused people to starve in the first place.

The depoliticisation of aid

For many observers, it seems counter-intuitive to argue that aid has become depoliticised. Over the past decade it has it become generally accepted that aid has

gone in the opposite direction, becoming more, not less, politicised, as the 'humanitarian space' has closed up, and agencies moved from an ethical domain into an ever-closer alliance with political and military actors.[44] While this may be true at the macro-level – when looking at the cumulative consequences of aid or the alliances forged by agencies – the micro-level practices of aid have become more and more technical, shaped by protocol and expertise. My point in this thesis, however, is that this 'retreat into technocracy' has merely led to an *appearance* of depoliticisation: a carefully cultivated image of aid as a purely moral act. Humanitarianism is proud of its principles: those ideals of neutrality, impartiality and independence, which separate it from the grubby world of politics. In the 'classical' ideal, humanitarianism is moral, impartial and value-driven, whereas politics is amoral, partial and interest-driven; humanitarians keep their distance from politics, and are warned, in the words of Jean Pictet, to 'beware of politics as they would of poison, for it threatens their very lives'.[45]

These technocratic tendencies go back a long way, but have become particularly prominent in the last two decades.[46] In the 1990s, the humanitarian industry suffered a crisis of confidence, which led to a proliferation of accountability procedures, charters and standards. These were a response to various criticisms emerging from the debacle in Rwanda: that humanitarian aid is economically damaging, that it serves the most powerful, that it is vulnerable to manipulation, and

[44] For a good analysis of this trend, see Fabrice Weissman et al., eds., *In the shadow of 'just' wars: violence, politics and humanitarian action*, (London: C. Hurst, 2004).
[45] Jean Pictet, *The fundamental principles of the Red Cross: a commentary* (Geneva: Henry Dunant Institute, 1979), 56.
[46] Early versions of this technocratic approach to relief can be seen in the social engineering of late 19th-Century welfare movements, the emergence of scientific philanthropy, and the articulation of human needs in purely quantitative terms. See Gertrude Himmelfarb, *Poverty and compassion : the moral imagination of the late Victorians* (New York: Knopf, 1991); Barbara Howe, 'The Emergence of Scientific Philanthropy, 1900-1920', in *Philanthropy and cultural imperialism: the foundations at home and abroad*, ed. Robert F. Arnove, (Boston: G.K. Hall, 1980); Paul Weindling, 'From sentiment to science: children's relief organisations and the problem of malnutrition in inter-war Europe', *Disasters* 18, no. 3 (1994).

that it intensifies rather than resolving conflict.[47] By creating a technical toolkit for humanitarian situations, agencies wanted to isolate the social and political implications of their work, reducing humanitarian aid to a rational task, a set of objective procedures. Although the late 1990s saw more humanitarians embrace politics – a movement that has been termed 'new humanitarianism' – many aid agencies continued to shy away from overtly political stands in contentious environments, and in many ways, their success still relies on being perceived as moral rather than political in their nature.[48]

The Sphere handbook is a good example of the standardised procedures that have gripped the sector in the past two decades. This set of 'minimum standards', which was produced in consultation with over 400 humanitarian agencies, demonstrates the reduction of relief to a set of stipulations.[49] The standards contain hundreds of rules and indicators in five specialised areas, and go down to the most intricate detail – including, for example, the number and size of cooking pots for each household.[50] Such handbooks are a good barometer of humanitarian practice. If we take Oxfam as one example, we can trace a gradual shift towards ever more technocratic stipulations. Oxfam's first humanitarian guidelines were produced in 1971, consisting of just 30 pages of typed and photocopied text, with no specific guidance for feeding. By the early 1980s there were several documents that acted as

[47] This crisis of confidence was a direct outcome of the Rwanda crisis, particularly after the publication of an extensive inter-agency report, and trenchant critiques such as those penned by Alex De Waal. See Rakiya Omaar and Alexander De Waal, 'Humanitarianism unbound? Current dilemmas facing multi-mandate relief operations in political emergencies' (London: African Rights, 1994); De Waal, *Famine crimes*.

[48] Chandler, 'The road to military humanitarianism'.

[49] For some background to the Sphere project, see Peter Walker and Susan Purdin, 'Birthing Sphere', *Disasters* 28, no. 2 (2004); Margie Buchanan-Smith, 'How the Sphere Project came into being: A Case Study of Policy-making in the Humanitarian Aid Sector and the Relative Influence of Research' (London: ODI, 2003); James Darcy, 'Locating responsibility: The Sphere Humanitarian Charter and its rationale', *Disasters* 28, no. 2 (2004).

[50] 'Each household has access to a large-sized cooking pot with handle and a pan to act as a lid; a medium-sized cooking pot with handle and lid; a basin for food preparation or serving; a kitchen knife; and two wooden serving spoons… each person has access to a dished plate, a metal spoon and a mug or drinking vessel… all cutlery, bowls, plates and mugs should be of stainless steel or other non-ferrous metal.' Sphere Project, *Humanitarian Charter and Minimum Standards*, 223-24.

handbooks specifically for nutrition, including an illustrated booklet for relief workers. By the late 1990s we see a large range of lengthy documents, including several concerning humanitarian nutrition alone. Each of these contained new objects and technologies, and by the millennium, Oxfam had an equipment catalogue listing all the emergency items in its warehouse, which alone ran to over 200 pages.[51]

This thesis looks in detail at these procedures, highlighting their intensely political nature. Despite the insistence that humanitarianism can be separated from politics, I demonstrate how these procedures are embedded in politics, culture, and society. I examine the limits of objectivity, problematizing the 'retreat into technocracy'. Concentrating on nutrition, I look at the construction of scientific categories: the creation of 'normality' in statistics, and declarations of where hunger begins. I explore where arbitrariness emerges, where measuring tapes are pulled a bit looser, or distributions depend on one's posture. I examine methods of manipulation: when refugees work the system to their advantage, or where logisticians seek simplicity in supplies. I trace the politics behind procedures: the anti-racism beneath feeding programmes, or the implications of vitamins for wage campaigns. These moments demonstrate the limits of the humanitarian nutritional system, where procedures are resisted and politics emerges. Far from acting with dewy-eyed compassion and 'waxing tender over drowning flies', aid workers are engaged in a contested and thoroughly political project. The best place to start illustrating this regime is with a sketch of humanitarian practice – in a refugee camp called Yusuf Batil.

[51] 'Standing operational procedures for disasters', 1971, Oxfam archives, file PRG/5/4/4, Bicester, UK; 'Oxfam feeding kits', April 1984, Oxfam archives, file PRG/5/4/25, Sue Peel 'Selective feeding procedures', 1979, RSC grey literature collection, A-51 PEE, Bodleian library, Oxford, UK. 'Humanitarian department equipment catalogue', May 2000, PRG/5/4/13; Oxfam, 'logistics handbook', October 2000, PRG 5/4/12; Oxfam, 'Emergency response manual', January 2002, PRG/5/4/5; Susanne Jaspars and Hisham Khogali, "Oxfam's approach to nutrition surveys in emergencies," (Oxford: Oxfam, 2001).

2.

Visible foods and invisible nutrients

Contemporary humanitarian aid

Most visitors approach Yusuf Batil from the air. Their first view of the camp comes after an hour's flight in a light aircraft or helicopter, passing over barely-inhabited swamp and savannah. On approach to the dirt airstrip servicing the camp, speckles of blue and white appear below, and tents begin to coalesce in the form of an elongated diamond. The view is particularly striking in such a remote area. With a single, muddy road winding away from the camp's northern extremity, and tents clustered in an expanse of green, it looks incongruous, as though transplanted from elsewhere. Yet this is one of several refugee camps in Maban county of South Sudan: a sparsely populated corner of the world's newest country, which, in the summer of 2012, hosted over 120,000 refugees from neighbouring Sudan.[1]

The refugees arrived in October of the previous year, walking for up to a week to cross the border. Although two refugee camps were rapidly established, overcrowding became a problem, and conditions deteriorated with the arrival of the seasonal rains. By June 2012, many areas of Maban were submerged in pools of stagnant water, and the camps were particularly affected, since they sat on low swampy ground near tributaries of the Nile. Yusuf Batil was founded in the summer of 2012 to relieve pressure on the existing camps: it was situated on slightly higher ground with a good supply of drinking water, but operations were still difficult. Most of the roads had become impassable, the dirt airstrip was often unusable, and the nearest large airport was over five hours drive away.

[1] For more details on the background to this conflict, see Douglas Johnson, *The root causes of Sudan's civil wars: peace or truce* (Oxford: James Currey, 2011), Chapters 10 and 12. The figures come from UNHCR website of statistics, available at http://data.unhcr.org/SouthSudan.

This chapter describes the food and nutrition programmes in Yusuf Batil, offering a portrayal of humanitarian response in an emergency setting. Emergency nutrition can be divided into two main activities: measuring hunger, and feeding the starving, both of which were crucial in Yusuf Batil. The first half of this chapter examines the measurement of hunger, the way anthropometry was used to screen people according to need; the second half examines procedures for feeding the starving, focusing on supplementary and therapeutic feeding. Both are underpinned by what I call, following Gyorgy Scrinis, 'nutritionism', which presents food in terms of its constituent nutrients, and hunger as a shortfall in these nutrients. This chapter illustrates nutritionism in emergencies, and teases out its main implications. It provides a context for the subsequent historical chapters: a description of present arrangements, onto which historical changes can be mapped.[2]

In addition, the chapter makes a central argument, which will be returned to throughout this thesis: that humanitarian nutrition is preoccupied with control and efficiency. In nutritional programmes, the key objects are not foods, but the chemical components of food; the key task is not to provide what people eat, but the nutrients they need. Visible foods are replaced by invisible nutrients, and aid becomes a matter of paternalistic control. In the name of emergency and efficiency, agencies determine what people eat, and shape how they can eat it. The aid agency not only presumes to know what is best for the refugee, but also keeps them mute, diagnosing hunger through bodily measurement and minimal participation.

[2] Readers may be concerned about the representativeness of this field research as a description of present arrangements, fearing that I am simply illustrating a particular nutritional programme, run by a particular agency, in a particular time and place. Any familiarity with the humanitarian system would dispel such concerns, however: the structure of therapeutic and supplementary feeding as described in this chapter is very much in line with international guidelines and recommendations. For examples, see Sphere Project, *Humanitarian Charter and Minimum Standards*; UNHCR, *Handbook for emergencies* (Geneva: Office of the United Nations High Commissioner for Refugees, 1999); World Food Programme, *Food and nutrition handbook*; World Health Organization, *The management of nutrition in major emergencies*. More detail on my approach to this fieldwork can be found in chapter three.

Measuring hunger

Humanitarian feeding starts with triage. When faced with a large number of hungry people, aid agencies measure and categorise malnourishment, using anthropometry as a screening method. The main anthropometric measurement is the 'mid-upper arm circumference', or MUAC, which determines nutritional status through the wastage of muscle and sub-cutaneous fat in the limb. To take this measurement, a strip of plastic tape is wrapped around the arm, halfway between the elbow and shoulder, pulled tight, and read. This tape is colour-coded with red, yellow and green sections, which indicate different levels of malnourishment. If the measurement falls in the red zone of the strip, the person is diagnosed with severe malnutrition, if it falls in the yellow zone, this indicates moderate malnourishment, and readings in the green zone indicate the individual is adequately nourished.

Although protocols differ from one situation to the next, there are usually three main types of nutritional assistance. A red MUAC implies the need for a 'therapeutic feeding programme', where patients are closely monitored and provided with specially-prepared foods, designed to build strength and body mass. A yellow MUAC leads to 'supplementary rations': a selection of fortified cereals that are cooked at home and integrated into the regular diet. A green MUAC suggests that no targeted assistance is needed, although people will usually receive 'general rations', which are provided to all families regardless of their nutritional status. The MUAC provides a rapid assessment of vulnerability, determining the nature of subsequent interventions.

All refugees in Yusuf Batil underwent some kind of anthropometric examination before they received food relief. These measurements were usually

carried out by 'community outreach teams', who moved through the camps checking the upper arm measurements of every child under five. Each morning, the teams set off from a compound at the centre of the camp, walking for up to an hour and a half to reach people living at its extremities. They were usually the first contact most refugees had with the nutritional system, making them a particularly good place to start analysis. I accompanied these teams on a number of trips around Yusuf Batil, and the following events, which give a good sense of the MUAC screening process, took place on 28th July 2012.

Community screening

There were two organisers of the outreach team, and I met them over lunch: Amina, a nutritionist from Ethiopia, and Mohammed, a young man from South Sudan.[3] They lived in the main organisational compound at the midpoint of Yusuf Batil camp, which was a patch of muddy earth surrounded by a straw fence, consisting of shared tents thrown up on higher, less sodden ground. We sat on a tarpaulin outside Amina's tent, eating rice and lentils, cooked over an open fire – the same food we ate every day. Since it was only a few months since the establishment of Yusuf Batil, the compound was very rudimentary. There was no communication except radios and a satellite phone, we slept on mattresses in shared tents, and the latrines were a hole in the soil surrounded with a piece of tarpaulin for privacy. As time went on, humanitarian agencies began to develop their compounds into more permanent spaces, with lodgings, shower blocks, tight security, and regular Internet, but at this point, facilities remained limited, and accommodation very basic.

[3] All names have been changed. Amina was superior to Mohammed, who translated and organised the rest of the team. There were six other, casual employees drawn from the local refugee population, paid a daily rate to organise and measure the children.

We set off from the compound after lunch, walking over marshy ground and under sparse tree cover for around fifty minutes to reach a distant collection of tents. The camp was organised in clusters, with refugees grouped by their home villages and living under a sheikh, the intermediary for humanitarian agencies.[4] Each day, the team identified two or three sheikhs from a list provided by UNHCR, and screened all the children in these clusters. On this particular day, they were searching for the village of Sheikh Bashir. There was no map of the camp so the team wandered, asking passers-by for directions, and eventually found Bashir's tent next to a large meeting area: a clearing in the tents and trees surrounded by logs.

The screening took place in three stages. In the first stage, children were lined up, and their height was measured using a rough stick: a thin branch taken from a local tree with two notches carved into it. The sticks were used as an indicator of age, with the first notch set at 110cm, under which a child was considered to be below five, and the second notch at 95 cm, below which the child was considered under three. Since birth dates were rarely recorded, and ages could not be determined with any accuracy, the stick was used as a substitute for age. Eligibility for the feeding programme, in this case, was restricted to children under five, so any child over 110cm in height was taken out of the line and asked to leave.[5]

In the second step, children had their MUAC measurements taken. The colourful plastic strip was wrapped around the upper arm, inserted into itself, and the reading called out. One person took the reading, and another kept a tally of results: red readings in one column, yellow in another, and green in a third. The MUAC reader also looked for signs of a watery swelling on the arms and legs, which was tested by depressing a thumb or forefinger into the child's flesh. If the depression

[4] 'Sheikh' is an administrative term in Sudan for a village headman or chief.
[5] In some cases, feeding is restricted to the under threes – hence the second notch. This depends on the scale of malnourishment and the resources available: children are most vulnerable to malnourishment in their first three years of life, when they are weaned or displaced from the breast by new siblings, so this group take priority.

lasted for longer than a second or two, the child was identified as having oedema – an indication of kwashiorkor – and was tallied on the chart accordingly. After the children had been measured and examined, the process of exclusion continued: children with a green MUAC measurement were removed from the line, along with those who were still being breastfed.[6]

The third step was administrative. After being screened and tallied, each child moved forward with their mother to see Amina and Mohammed, who filled in forms and distributed paperwork. Every household was given a card that entitled them to supplementary rations, containing the number of eligible children in the household, along with their MUAC readings. All children with a red MUAC were also given a referral slip, entitling them to admission to a therapeutic feeding programme. These ration cards and referral slips were usually tucked away into the mother's clothes, or carefully placed into a plastic bag alongside their refugee registration details. Later, they could be used to collect supplementary rations or therapeutic foods at different locations in the camp.

The screening process was refined and practiced to such an extent that 194 people were examined in just over an hour. It resembled a production line, which began with a queue, and ended with the distribution of paperwork. The whole system of nutritional interventions started here, facilitated by the MUAC band, which was the key determinant of access. This object organised children and categorised their bodies into different types. It established what foodstuffs people were entitled to, what registration cards they would receive, and who they would see next. A great deal was invested in these MUAC measurements, which determined a child's subsequent entitlements.

[6] Nutrition handbooks emphasise that breastfeeding is the best form of nutrition for babies, so breastfeeding children were not admissible to the programme.

The power of the MUAC band was amazing: with a short strip of plastic tape, the most vulnerable children were identified, and the prevalence of malnutrition was tallied. Studies have revealed what a good indicator these strips are for predicting mortality, and their cheap, lightweight simplicity meant the MUAC bands could be widely distributed and used by the illiterate.[7] In Yusuf Batil, a child in the red zone could be immediately referred to a therapeutic feeding programme, and those with yellow measurements registered for supplementary rations. With so many people in need, the system seemed scientific, objective and fair. It also allowed statistics to be collected about the prevalence of hunger in the camp, as tallies were converted into data for later analysis.[8]

At the same time, the categorisation of bodies was a highly impersonal procedure. It was carried out rapidly and in silence, except for the odd word to issue instructions or gain administrative information. The relationship was entirely one way, led from the top down. The outreach team issued instructions, and the refugees complied. People were moved from one stage to the next with little explanation or discussion. Those who failed the anthropometric tests were removed from the line, sometimes quite roughly. There was an air of officiousness around the process, and Mohammed, in particular, was relentlessly curt: snapping fingers, pushing people along, and asking sharp directed questions. It was hard to say whether this conduct was individual, or cultural, or widely expected amongst the refugees, but it reinforced the impression of a process that had little interest in individual lives, concerned instead with efficiency – measuring the largest number of people in the least amount of time.

[7] Steve Collins et al., 'Management of severe acute malnutrition in children', *The Lancet* 368, no. 9551 (2006). The colour-coded measurements are designed for use by the illiterate.
[8] In Yusuf Batil, for example, this screening eventually revealed that around 10.1% of children fell in the red zone of the MUAC strip, and 17.6% into the yellow zone, meaning that some kind of malnourishment ('Global Acute Malnutrition') affected 27.7% of the population. The threshold for declaration of an emergency is 10%.

This is a feature of anthropometric screening more generally. Rather than talking and interacting with refugees, the process leaves them mute. It actively silences people, reducing them to physical measurements. It does not allow people to speak of their hunger, to articulate problems for themselves, nor does it encourage indigenous adaptation strategies.[9] Instead, it identifies their needs wordlessly, through bodily examination, and admits them to a pre-set programme of assistance. This is consistent with a nutritional worldview, which identifies hunger as a nutritional deficiency, to be determined by external intervention. The refugees waiting in line at Sheikh Bashir's meeting spot had limited choices: either they went along with the procedure, allowing their children to be measured for admission to a standardised feeding programme, or they resisted and withdrew entirely. There were no obvious mechanisms for regaining control of the process.

In any case, resistance to the relief system was utterly unattractive. People needed food, and in a remote refugee camp like Yusuf Batil, they had few ways of obtaining it. The distribution carried the weight of traditional and institutional authority, and resisting would deprive the family of the food on offer, identify them as troublesome, and would make little sense. Submitting to the system, after all, could bring advantage.[10] When in possession of the correct paperwork, a whole world opened up to the refugee: a world of cereals, packaged foods, nutritional advice, and organised distributions. In this system, the slips of paper *were* the advantage, the very point of submitting to the process. The slips of paper lubricated the administrative machinery, but were also a passage to benefit. This became particularly clear during

[9] The system does not encourage indigenous strategies, but they go on all the same; in fact, some authors have argued that such strategies are far more effective than international food aid itself. Alex De Waal, *Famine that kills: Darfur, Sudan* (Oxford: Clarendon Press, 1989).

[10] Of course, the system only brings advantage to *some* people. Others are taken out of the line, and are excluded from the food distribution, and so may have more incentive to resist. Yet they only learn about their exclusion after submitting to measurement, and since they will benefit from other programmes of assistance, they will be reluctant to be identified as a troublemaker to sheikhs and aid workers.

another screening I attended, during which the community assessment team returned to a sheikh's area for the second time.

A repeat screening visit

This sheikh was named Omar, and we were returning to his sector due to a change in policy. The children had been screened two weeks previously, but only those under three years old (shorter than 95cm) were included. Since then, the programme was expanded to cover all children under five, a decision based on fears of rising malnutrition in the camp. In other words, the population was deemed in greater need, so expanding the feeding programme was a way of offering rations to more families. As a result of this policy change the screening team had to return to several sectors and repeat the process. Every child had to be screened again, with the cut-off point for eligibility raised to 110cm. More children were to be included, and as a result, household ration cards and referral slips had to be destroyed and re-issued.

These documents were flimsy, hastily-photocopied bureaucratic necessities, but they had a great worth for the refugees. They offered a promise of future advantage, as the ration cards could soon be converted into food. This promise made most mothers very reluctant to part with them. The refugees located and unfurled their documents with great care, removing them from plastic bags and extracting them from the rolls of clothing into which they had been tucked. But as this paperwork was unceremoniously ripped up by Mohammed, and as Amina wrote out new slips and ration cards, it became clear that an opportunity was emerging: a rare chance to influence the nutritional machinery.

The refugees' concern was to maintain or increase their advantage, and once it became clear that the paperwork constituted a promise of more resources, their

destruction also became an opening. In this gap, the refugees could insert their own claims and leave their own mark. During the first screening visit the paperwork had been placed in their hands with little input, their content determined by silent quantification, the purpose of which was obscure. But in this repeat screening many mothers understood what was at stake and tried to shape the outcome to their advantage. This gap, this pause that opened up between the destruction of their first registration slip and the production of a new one, was a space in which they could speak.

As Amina's pen hovered above the new slip, the mothers began to appeal: clarifying the number and age of their children, making the case for new inclusions, and disputing the information that had been recorded. These appeals usually centred on the nature and extent of the household. Some mothers were able to bring all their children to the screening, but others had to speak on behalf of people who were absent. A child might be sick at home and could not line up in the midday sun; a mother might be at the market and a neighbour had to bring the child instead; an infant might be cared for by a grandmother or distant relative. Such situations led to lengthy discussion before pen was finally put to paper. In this space, it was possible to press a case for inclusion or advantage, to intervene and make the best of what, until then, had been a sealed process.

To be efficient, the process required precision and order. It favoured children in neat categories, named and measured, placed under a mother or head of household. For the system to work smoothly, a child had to be brought to the screening in person, accounted for by its main carer, associated with a household unit, and clearly fitted into the main categories of measurement. But far from discriminating against the less simple cases, this precision opened possibilities for the refugee. When a grandmother, older sibling, or friend brought the children to be lined up, some order had to be

extracted from a complex arrangement of care. What seemed at first to be an oppressively silent, objectifying process contained some sites for negotiation. Efficiency may have been sacrificed in this negotiation, but a sense of personhood was restored.

Two examples can illustrate this. In the first, a mother appealed to Amina to include a breastfeeding baby on her ration card. In the previous screening, this baby was excluded as too young. According to the programme's protocol, only children from 6-months to 5-years could be admitted to the feeding scheme, so breastfeeding was used as an indication of insufficient age. Just as height was a substitute for the upper age bracket, exclusive breastfeeding was a substitute for the lower age bracket. There was a lot of room here for negotiation, and in this case, the mother sought to have her baby reclassified. She insisted that her baby had been weaned since the initial screening, and claimed that the baby was now over six months. The mother clearly understood the stakes involved. If her baby could be included on the paperwork, she could increase her eligibility for supplementary foods by an additional ration: a significant increase in the resources available for her family. In this case, she succeeded, and her rations were increased.

In the second example, a less directed intervention was responsible for changing the outcome. Rather than the mother appealing for a change in the records, the measurement was influenced by a subjective judgement. These situations arose regularly, whenever there were limit cases. Any measurement that was near the notch on the height stick, or near the boundary of the yellow and green sections of the MUAC band, required a quick decision by the aid worker. In this split-second judgement, a family's resources were decided. Any number of small factors could determine food entitlements: a protruding braid of hair or slouched posture made the difference between the inclusion of a child or their exclusion; a slightly looser pull of

the MUAC band brought a child into the green zone from the yellow zone. In these cases, the measurer paused, looked for a moment, made a judgement, and then pushed people in or out of the line. The knock-on effect was a ration given or taken away.

Both examples raise questions about the objectivity of the MUAC screening. They illustrate the opening of this tightly circumscribed procedure, the moment when this process, which aims at being objective and fair, became disrupted. The difference between being included or excluded often turned on something small and seemingly irrelevant: in the first case, whether a mother spoke up, in the second example, whether a child stood upright. There was more scope in the first case for the refugee's voice to be heard, but both revealed an arbitrary component to the screening; for all the attempts to build a fair way of allocating resources, the reliance on cut-off points left a capricious element to the process. The transition between breastfeeding and weaning, between being 104 and 105cm in height, between having a MUAC measurement in the yellow zone or the green zone could never be exact or consistent. Where objective science met messy reality, a judgement had to be made.

A line must be drawn somewhere, but it still leads to problems. Anthropometry relies on an idea of normality, an average body size against which people are measured – something produced by a survey of body shapes around the world. The problem with comparing bodies to normality is the inevitable exceptions, and South Sudan contains plenty of these; there are, for example, Nilotic people like the Dinka, who are taller and thinner than average. But even if these cases are taken into account, cut-off points have other problems. Starvation is a subjective and social experience as much as a physical one, and by reducing malnourishment to its purely physical manifestations, the MUAC process misses the cultural ramifications of persistence dearth, and the long-term socio-economic problems underpinning hunger. The cut-off points also risk abandoning people once they have recovered from

extreme starvation. Even after being objectively identified as 'adequately nourished', they may remain hungry, have insufficient access to food, and suffer from the social problems accompanying widespread malnourishment.

Such drawbacks are numerous, but the system is designed with a limited aim: to act as a safety net, to rescue people most at risk. For all its dehumanising implications, the MUAC screening is justified by the need for triage, to separate the worst cases. But even in this task, it is not strictly necessary. In Yusuf Batil, it was striking how the really terrible cases of malnourishment could be identified without taking a measuring tape to anyone's arms: the distended bellies, thin limbs and staring eyes of the severely malnourished were obvious, even to the uninitiated. Advocates of community-based techniques have argued that anyone can identify severe malnourishment, and that no particular expertise is needed.[11] Nevertheless, the MUAC band has developed a grip on humanitarian aid, relied upon as a benchmark despite problems such as redundancy, pliability, arbitrariness, and the suppression of subjective experience.

The persistence of the MUAC process, therefore, lies not in its indispensability or its objectivity, but in its utility to aid agencies. It may not empower local people, but it allows aid workers to screen hundreds of people in a relatively short time. Above all, the MUAC provides efficiency, which is a huge advantage to humanitarians. With such a large population in need, the MUAC tape is a quick and easy reference point for screening. By locating malnourishment in a purely physical measurement and silencing subjective appeals to hunger, the system imposes order on chaotic circumstances. It provides some regularity to admission, ensuring that the greatest number of people can be screened in the shortest possible time.

[11] David Morley, 'Limitation of film strip and bangle test for identification of malnourished children', *The American Journal of Clinical Nutrition* 32, no. 11 (1979).

But the MUAC also has value because it externalises the judgement of who to assist, it takes difficult ethical decisions out of the nutritionist's hands. Relief work is laden with heavy moral implications, dilemmas about when to grant or withdraw assistance. If the nutritionist makes a judgement about who to assist *without* anthropometry, *without* the appearance of objectivity, she might end up morally paralysed and open to accusations of bias. Yet the MUAC system provides a regularised procedure, an authority that is difficult to contest. The judgement about who to assist is surrendered to the brightly coloured MUAC tape, and for the aid worker, its value is transparency: the rationale for the decision is open for all to see. It prevents even greater contestation of the process, and facilitates control and increased efficiency for humanitarians working in Yusuf Batil.

Supplementary feeding

The supplementary feeding began on a bright Sunday morning, just after the screening visits had finished. The launch date had been in the diary for several weeks, and everyone was working long days to ensure the food distribution could begin on schedule. Over the previous few days, casual labourers had been employed to prepare the site, and the nutritionist managing the distribution was regularly found pacing the area, sketching the anticipated flow of people through the gated compound. Several huts were prepared, made from branches trussed together with twine, with waiting areas offering limited cover from sun and rain. The labourers relied on wood from local trees, coated with UNHCR tarpaulin. They levelled the ground, constructed fencing, and demarcated areas where the stages of distribution could take place.

The mantra in the preparation of this space was 'crowd control': keeping order, and ensuring that the refugees file in an orderly way through the different

stages of distribution.[12] The manager of the nutritionist team, a man called Dawit, seemed very worried about the launch, because the task was huge. Thousands of children needed to come through the site every day to ensure the rations could be distributed regularly. The whole space had to be managed carefully, and systems needed to be very efficient to get food to all registered families. According to Dawit, some of the other humanitarian agencies doubted whether the feat could be pulled off, so the stakes were high for the team.

Despite stress amongst the aid workers, however, the distribution began on time. Refugees were organised according to their sheikh, and invited to come to the compound at 8.30 am. When the grass compound gate was opened, the refugees moved through the main stages of the distribution process. First, they were asked to sit in a large open area for hygiene education, where instructions were issued on the correct use of water and utensils. Next, they were led to a small gazebo in front of a wood fire, where they were given a cooking demonstration and told how to make fortified cereals into a stiff porridge. After a long wait, the refugees were led to the registration hut, where the children in each household were counted, measured again, and their details taken down in large black ledgers. Finally, the mother or carer was issued with a registration card and sent away with packets containing a moist, yellow corn meal. In order to get this food, the refugees had to pass through all stages: it was food distribution combined with behaviour change in a distinct humanitarian bundle.

The end point was a small distribution room, where bags of fortified cereal – known as Fortified Blended Food (FBF) – were given out. This food, common in emergency feeding across the world, is a combination of flours that have been fortified with vitamins and mixed into a blend. The most common type is Corn-Soya

[12] Strategies for crowd control and orderly food distribution can be found in a number of humanitarian handbooks. See, for example, World Health Organization, *The management of nutrition in major emergencies*, 65-66.

Blend (CSB), a pre-cooked mix of maize flour and soya. In this programme, two types of CSB were being distributed. The first was an enhanced CSB known as Super Cereal Plus: a yellow, finely-milled flour, enhanced with milk powder, sugar and oil, coming pre-packed in silver-blue bags of 1.5kg.[13] The second was standard CSB, which came in huge sacks weighing 25kg, and had to be broken down into smaller portions and packed in plastic. To improve its nutritional profile, the team fortified the second type of flour, combining it with vegetable oil and sugar in what they called a 'CSB premix': a kind of homemade version of Super Cereal Plus, with additional nutrients added by hand.

The three components of the premix were mixed together onsite, in a specially constructed hut, which sat at the centre of the compound in Yusuf Batil. The hut was much like the other constructions in the compound except that it had synthetic tarpaulin stapled on the floor, walls, and ceiling in an attempt to keep the area more hygienic. Inside, a kilogram of CSB was mixed with 200g of sugar and 200ml of oil, before being weighed into portions, and poured into plastic bags purchased from the local market. By 9 am, a production line had begun, with large sacks of CSB being opened and divided into kilogram units. Oil was poured into measuring jugs, sugar was weighed out, and all three ingredients were added together and stirred in bowls. The final product was a sweeter, slightly moister meal, which was divided into portions, tied up in a bag, and carried over to the distribution tent.[14] It was messy work: the tarpaulin on the floor was grainy and oleaginous, the vegetable oil coated every surface in a fine film, and the CSB covered hands and feet in a gritty crust, but spirits were high inside the hut. The mixing was done by people employed from the

[13] This product is sometimes known as CSB++. It is higher in fat, energy and protein than standard CSB.

[14] The premix was given in bags of 3.6kg, which constituted 15 days supply for each child. Each child aged 3-5 was entitled to 240g pre-mix per day (made up of 200g CSB, 20g sugar and 20ml oil). All children aged 6 months to 3 years were given two 1.5 kg packs of Super Cereal Plus, a ration of just over 200g per day.

refugee population on a daily rate, who said how good it was to have work; it was the greatest benefit in the camp. Thirty South Sudanese Pounds per day (about $9 in July 2012), which could be used to buy sorghum in the market – a staple that was much preferred to the fortified cereals being distributed outside.

Alongside high spirits in the mixing tent, however, there was some discontent amongst aid workers outside. The team meetings had, in recent days, often returned to the problem of the premix, which caused a great deal of extra work for the logistics team. A few nights previously, a new British logistician, who had just joined the team in Yusuf Batil, questioned the need for the premix. Sat around a fragile table, under a thatched covering, amid clouds of insects and a pool of fluorescent light, he spoke up at a team meeting. What is the point of this pre-mix, he enquired. Why is so much effort put into mixing these commodities and repackaging them? Wouldn't refugees have more use for the CSB, the oil, and the sugar on their own? The logistician suggested that distributing these items separately would be much easier for all the staff, since it would mean no extra labour to hire and no additional mixing to manage. He argued it would be much easier for the logistics team, as they would not have to source buckets, bowls, and weighing scales in a remote area where these things are hard to find. He also suggested that distributing these items separately would be better for the refugees, since they could use the commodities as they wished. With Ramadan around the corner, a number of refugees had already requested sugar for making sweets and vegetable oil for cooking, but producing the premix prevented the use of sugar or oil for anything else, since it combined the commodities into flour, which could only be made into a sweet and sticky porridge. Producing the premix, therefore, produced more work for the team, and reduced the choice of the refugees.

The issue seemed obvious for this logistician. He saw a world of objects and effort: sacks of CSB, cans of oil, and bags of sugar in the warehouse, all of which

needed to be delivered into the hands of the refugees as simply as possible. He thought about the mixing process, and calculated the effort needed to combine these commodities and then re-separate them into portions for distribution. He also saw the desire of the refugees for individual commodities, and questioned the value of mixing them together. Yet this intervention was heretical to the nutritionist, who had a very different worldview. Rather than seeing the whole objects – the sacks of CSB, cans of oil, and bags of sugar – the nutritionist saw individual nutrients. For the nutritionist, foods were merely vehicles for delivering nutrients to the body. In response to the logistician's query, Dawit spoke up. The mixing process is essential, he said, to ensure people get the right balance of nutrients in their food. If we give out the commodities individually, we do not know how they will be used, and they may be taken straight down to the market for sale. But if we mix them, we produce a food with the correct nutritional profile, which people will eat as a unit.

This short response revealed a lot about the aim of the programme, which was to control, as much as possible, the intake of individuals. Dawit did not want people using the different commodities separately, and did not want people to sell them on. It mattered to him if people sold the food, or used the components separately in other meals, because the path of nutrients, from commodity to body, needed to be controlled. According to his perspective, it was irrelevant that families may wish to sell the commodities, or use them in different arrangements if they felt this would be best for them. Dawit won the argument, and everything was to be mixed, because this allowed the whole process, from distribution to ingestion, to be organised and supervised by the humanitarian staff.

The cooking demonstration

The preoccupation with controlling food was repeated in the cooking demonstration, which took place under a gazebo, with lines of benches opposite a cooking fire. After a long wait at the gate, the refugees came in and sat in rows, facing some logs smouldering under thatched cover. A woman stood up and explained how to cook the CSB. She had a pan of water, which she placed on the heat, and she told the audience to heat the water until boiling, add the CSB in a ratio of one cup to four of water, and cook for around 10 minutes. The resulting porridge was thick, sweet, and warm, a little like a corn tortilla slopped up in a bowl. It was to be eaten like many staples in Africa, with greens, relish or meat, but the mixture was fortified so it could be eaten alone. It was a strange kind of food, designed to have everything needed for short-term nutrition. The cornmeal provided carbohydrates, it had soy flour for protein, sugar for extra calories, and a number of vitamins and minerals to prevent micronutrient deficiencies. It was also extruded and precooked, so it only needed to be heated and reconstituted – the 10-minute cooking time was more a hygiene precaution than a process to make it edible.

The powder was the result of industrial production – refining, processing, and fortifying.[15] It was not the kind of food most people were used to eating, but was designed to approximate the nutritional value of the best diets. Without the form and taste, it provided what pulses provide, what greens provide, what meat provides. All the nutritionally important parts of a varied diet were packed into this porridge, which offered a kind of inverted intake of food: okra without the okra, lentils without the lentils, nutrients without the food. The refugees did not need other foods if given this

[15] The history of this product will be explored more fully in chapters five and six.

enhanced CSB. It was a rationalised, efficient, solution to dearth, making the most of shortage, and transforming a meal of porridge into a nutritionally sufficient diet.

All the same, it seemed that people preferred the whole foods in Yusuf Batil. The staple food was sorghum, and the Ingessana people who made up most of the refugees were often calling for sorghum in camp management meetings.[16] They made this into bread called *kisra*, which was eaten with okra or local spinach, with goat meat or lentils. Sesame was also a key part of the diet, especially used in ceremonies and rituals.[17]

These traditional whole foods were still obtainable in the camp, largely through the market, where a small tin of sorghum grains could be purchased for 10 South Sudanese Pounds (SSP).[18] To convert this grain into bread, the sorghum needed to be ground, but grinding stones were hard to come by. These were heavy, carefully shaped pieces of hard rock, which were so weighty that few refugees were able to carry them when they fled. As a result, they had to share grindstones, often between up to 50 people, and it took time to queue, and even longer to grind the grain. For the wealthy, the grain could be taken to a motorised mill, powered by a generator, but at a price of 3-4 SSP to grind a tin (about a dollar), it was a convenience that remained beyond the reach of most refugees.

Foods like sorghum and facilities like mills were not available in the supplementary feeding programmes, despite their local importance. Some whole foods were supplied by the World Food Programme in their 'general rations', but otherwise these foods had to be purchased with cash, earned through labouring or by

[16] As a result, sorghum was included into the general food rations (see note 19, below), but this forum for refugee participation did not affect the more technocratic supplementary feeding programmes.
[17] This was reported to me by local staff, and has been documented in H. R. J. Davies, 'A Study of Tribal Re-Adjustment in the Nile Valley: The Experience of the Ingessana', *The Geographical Journal* 130, no. 3 (1964); M. C. Jedrej, 'Some structural features of Ingessana marriage and affinity', *Africa: Journal of the International African Institute* 49, no. 4 (1979).
[18] About $3 in July 2012.

selling animals and other possessions.[19] Cash, crops and work: these were the most demanded forms as assistance, but they were not really being provided by the agencies in Yusuf Batil.[20] Cash was available through labouring for international agencies on an ad-hoc basis, but only for the young, male, and able-bodied. There were no cash transfer schemes that might enable women to buy sorghum in the market, and no one was distributing seeds and tools, which could allow people to cultivate the fertile land around the camp.[21] Moreover, none of the international agencies seem to be addressing the lack of grindstones – a simple item that would ease the lives of many people. As a result, the problems lying at the root of hunger remained unaddressed: the shortages in whole foods like sorghum, in employment, cash, and self-reliance.

The nutritionists did not seem particularly concerned about the existing dietary practices of these refugees, or with supporting people to grow or purchase their preferred foods. Their concern, instead, was with delivering the requisite nutrients by providing enhanced CSB: a product that provided nutrients, not whole foods, and responded to the minimal requirements of the body with minimal involvement from the consumer. The problem of hunger, therefore, was recast as a nutritional deficiency, and the result was an external solution: the distribution of enhanced Corn Soy Blend in two different forms – the formal, neatly packaged Super Cereal Plus (delicately balanced with nutrients and sealed with instructions on the side) and the

[19] The general rations were quite distinct from supplementary feeding. They were distributed by a different organisation (the World Food Programme), and run with a far simpler registration process, that did not rely on anthropometric indicators or other measurements. General rations tended to provide more whole foods, such as oil, sugar, and cereals, and were meant to provide the local staple, rather than importing cereals.

[20] Generally, such provisions come at a later stage of the emergency – in this early stage, services and provisions were prioritised over self-help.

[21] Cash transfer schemes are common in other emergency contexts. See Pantaleo Cretì and Susanne Jaspars, *Cash-transfer programming in emergencies* (Oxford: Oxfam, 2006).It is likely that programmes for self-reliance and food security followed when the 'emergency' phase had passed, but land around Yusuf Batil was especially fertile in July and August of 2012; the notion of 'emergency' was restricting, regardless of what was requested.

homemade version, a ‘premix’, in which CSB was mixed with fat and sugar, and divided into oily plastic bags from the market.

At the end of the cooking demonstration, a man stood at the front and explained the difference between the two forms: the formal, neatly packaged flour, and the plastic bags of premix. A series of prescriptions and rules were passed on, which involved certain foods being eaten in certain ways, at certain times. Mothers were told to prepare the cereals separately, and to feed their children separately. They were told that the neatly packaged flour was to be given to the under-3s, and the premix to the 3-5 year olds. They were told not to give the mixes to the other type of child, nor to share them around the family. The two blends were alike in the powder but not in the packaging, and were distinguished according to some invisible category, associated with a set of confusing permissions.

The reason for the permissions was not explained. Without the knowledge of the nutritionist, who was able to see the profile of invisible nutrients, the only visible difference between these products was aesthetic: one was in a neat silvery blue packet, and the other in a scrappy plastic bag. Why was there a rule about whom these different foods were for, and how they should be cooked? Why could people not share the foods? Had the man at the front thought about all the extra work involved in cooking two different mixes for two different children, and then a different meal for the rest of the family?

It was no wonder that, according to the nutritionists, many mothers just went away and cooked the food to be eaten from a communal pot. Nutritionists have long sought ways to prevent the sharing of foods, to stop the combination of distributed rations into a communal cooking pot, but given the extra work involved in cooking three separate meals, it was unsurprising that the cereals tended to be eaten communally. It was all food, it was all cereal, and the product looked identical. The

permissions attached to these foods remained relatively obscure, and to confuse things further, they depended on the kind of feeding programme being instigated. Nutritionists talk in a great deal of acronyms: BSFPs, TSFPs and OTPs, each of which is a different arrangement of feeding. In these arrangements, the foodstuff may be the same, but they are attached to different expectations and permissions. A Blanket Supplementary Feeding programme (BSFP) and a Targeted Supplementary Feeding Programme (TSFP), for example, might both use CSB, but there are different rules about who receives them and different expectations about their use.

Therapeutic feeding

There is a different procedure for the severely malnourished, and a different product at its centre. Whereas supplementary feeding relies on CSB, therapeutic feeding relies on a food called Plumpy'nut. This thick, peanut paste is packed in silver sachets, adorned with red and white text, and made from vegetable fat, sugar, peanuts, vitamins and skimmed milk powder. It tastes like a sweetened peanut butter, and has, in the space of just a decade, cornered the market for therapeutic feeding. It has become widely relied upon in disasters, and can be seen packed in boxes and stacked high in the tent warehouses of Yusuf Batil. Whereas supplementary feeding has mixed results and often involves a good deal of variation and complexity, therapeutic feeding has become a stable process centred on Plumpy'nut. Therapeutic feeding, in many ways, *is* the provision of Plumpy'nut. The process is very simple, and involves giving sachets of Plumpy'nut to the severely malnourished until their weight increases to acceptable levels. [22]

[22] More details about Plumpy'nut, including ingredients and protocols for use, can be found on the manufacturers website: www.nutriset.fr/en.

In Maban, the peanut paste was supplied by Unicef and distributed in programmes known as OTPs, or Outpatient Therapeutic Programmes. These were run by NGOs, and issued supplies of Plumpy'nut to malnourished children on a weekly basis. The sachets were dispensed after a registration process, in which the MUAC dimension was supplemented by more detailed measurements of weight and height, alongside a clinical examination that might indicate medical complications. A registration card was then issued to each child, who was asked to return each week for monitoring and more supplies of Plumpy'nut. This process was repeated until a target weight had been reached, and the child could be discharged from the programme.

The OTP in Yusuf Batil was located in a large clinic at the centre of the refugee camp, whose purpose was geared towards the distribution of Plumpy'nut, Although the main clinic was involved in other activities (such as promoting breastfeeding, advising on weaning, and offering inpatient feeding to the very ill) the vast bulk of its work involved the provision and replenishment of peanut paste. This object lay at the centre of the OTP activity, and was the subject of some devotion on the part of aid workers. In conversation, many described it as a 'miracle product', a simple but effective invention that had remarkable effects. This idea of Plumpy'nut as a panacea, a miraculous solution to malnourishment, has been increasingly reflected in recent media reports. In a long commentary in the *New York Times*, for example, Plumpy'nut was described as 'an immunisation' against malnutrition, a 'magic' commodity, which results in the 'miraculous' transformation of children 'from literally skin and bones to certain survival in just four to six weeks'. Very similar language has appeared in numerous other newspaper articles, which often contain

'before and after' sketches drawn from discussion with aid workers, indicating the transformative effect of the product.[23]

Such intensive praise is based on strong evidence: a number of studies have shown recovery rates to rapidly improve when Plumpy'nut is used, making it a great improvement on previous foods used for the severely malnourished.[24] Yet the assumption that there is something miraculous in the combination of peanuts, sugar and vegetable fat is misplaced. The real success of Plumpy'nut lies in the way it has changed approaches to therapeutic care. Until recently, therapeutic feeding was a very top-down method, which involved admitting the severely malnourished to inpatient facilities and giving them milk-based formulas. These formulas were prepared from a powder, mixed with clean water, and administered by a feeding cup or nasal tube. The dangers of contamination meant that milk formulas needed to be mixed in a hygienic environment and children had to be fed by nurses or other professionals. This took control away from the mother, who became dependent on the feeding centre staff and had to wait by the child's side until they were discharged. This was disempowering and economically damaging, especially if the mother earned money or had other children to look after. These centres were also problematic for the humanitarian agencies, since they were expensive to maintain and required a high number of staff, beds and resources.

Plumpy'nut has been widely attributed with changing the practice of therapeutic feeding, transforming it into something less top-town, and more decentralised. Rather than admitting the most malnourished children as inpatients, they can now be treated as outpatients, with only the weakest and those with medical complications being supervised. Since the sachets do not require preparation, the

[23] Michael Wines, 'Hope for Hungry Children, Arriving in a Foil Packet', *New York Times,* 8 August 2005. See also Jonathan Clayton 'Africa's miracle food: Plumpy'nut' *The Times*, August 12, 2005, Page 6.
[24] Collins et al., 'Management of severe acute malnutrition in children'.

Plumpy'nut can be given directly to mothers, who just rip them open and give them to their child. There is still a concern that the wrong people will eat the sachets in the wrong way, but the need for costly inpatient feeding has disappeared, and more control and responsibility can be passed onto the family.[25] There is no longer any concern about contamination, because the sachets have a long shelf life, and can last for two years without refrigeration. Rather than undertaking all aspects of care for the severely malnourished, clinics now have a more limited focus – measuring bodies and distributing peanut paste – with actual feeding occurring at home. [26]

The real accomplishment of Plumpy'nut, therefore, relies not on any magical ingredients, but on its packaging and its ritual of distribution. Plumpy'nut comes as a paste, which liberates the food from the environment of the clinic. Furthermore, Plumpy'nut comes in an individual sachet, making it less easily shared, less easily incorporated into a communal pot. In other words, the 'miracle' of Plumpy'nut is more attributable to its visible, physical form than its invisible, nutritional content. It is not the nutritional balance of the product that has changed the success of therapeutic feeding so much as the way this product looks and feels, the way it is treated, and the system into which it is inserted. In Latour's terms, this object delegates and prescribes: it is a delegate for the work of reconstituting a powder, and it prescribes personal administration rather than communal consumption.

Just as in supplementary feeding, there is a clear concern with control and efficiency here, two tendencies that emerge as the reoccurring preoccupation of nutritional intervention. Regarding efficiency, Plumpy'nut seeks to deliver nutrients into the body quickly and effectively. It is a highly rationalised food, packed with

[25] The 'correct' use of Plumpy'nut is monitored through home visits by outpatient staff, and is termed 'compliance'. The procedure for compliance is contained in the field manuals – see footnote 26.
[26] Since it takes the treatment of malnourishment out of the clinic, and into the community, this approach has been termed 'the community-based management of acute malnutrition', or CMAM. The initial pilot programmes took place in Ethiopia in 2000, the model was formalised in 2002, and the first manual produced in 2006. See Valid International, *Community-based Therapeutic Care (CTC): a field manual* (Oxford: Valid International, 2006).

refined carbohydrates and fats, providing 500 kilocalories in a mere 92g packet. It is also a highly medicalised food, designed to return someone to health and rebuild their body mass. In fact, some organisations have completely reclassified Plumpy'nut as a medicine. In the protocols of the medical charity MSF, for example, it is described as a drug and prescribed by dosage, and the sachets even have 'only to be used under medical supervision' inscribed on their sides. This is the biochemical view of food taken to its logical conclusion: a packet of sweetened, fortified peanut butter, designed to facilitate an efficient transfer of nutrients into the malnourished individual, responding to a highly medicalised view of hunger.

Efficiency, however, takes place at the population as well as at the corporeal level. Products like Plumpy'nut move nutrients into the body efficiently, but therapeutic procedures distribute them across the population. Community-based therapeutic care wrenches these procedures from the expensive confines of the feeding centre, allowing hundreds of people to be treated on a daily basis – something that would have been impossible under the older model of inpatient care, which required large capital expenditures, a great deal of space, and a cumbersome corps of qualified professionals. Efficiency, therefore, can be seen in systems as well as foods, in production lines as well as products. Plumpy'nut facilitates an efficient transfer of nutrients into the malnourished individual, but its procedures expand this efficiency even wider.

As well as efficiency, there is also a perennial preoccupation with control. Therapeutic feeding regulates eating; it governs how people consume food. This may seem counter-intuitive, because Plumpy'nut seems to offer decentralisation, and the end of top-down, inpatient feeding, yet this new form of 'community-based care' is not an abdication of control, but its transformation into a new form. It is a different kind of control to supplementary feeding, which involves refugees silently lined up

and measured without involvement. This is control at a distance, control through objects. It operates through the restrictions of the object itself, which is presented as a personal portion and accompanied by a set of prescriptions: it must not be added to cooking, shared in the family, or applied to the face to improve the complexion. There are expectations of behaviour bound up in the distribution of the object, which are partly restricted by its form, and partly by the procedures surrounding it. The system relies on 'compliance': ensuring that people attend the outpatient facilities on a regular basis and eat the sachets in the correct manner. Plumpy'nut, in other words, allows the nutritionist to control the intake of nutrients, but it does so remotely.

Conclusion

When hunger is thought of as a disease, it becomes easier to contain and control. Dealing with malnutrition becomes a matter of medical protocol: systems can manage the worst cases, drugs can be prescribed, compliance can be monitored, and objects are crucial throughout this process. Plumpy'nut is particularly illustrative because it stands at the centre of a therapeutic feeding system, but what is obvious in the case of Plumpy'nut reflects a wider theme throughout this chapter: objects matter. They form the hub of the humanitarian system, around which all the other actors move. They are central components of relief, without which humanitarianism would not exist. At a basic level, this is obvious, because delivering basic supplies has always been the main aim of relief – something that takes up the bulk of time in places like Yusuf Batil, where supplies are so scarce and the crisis so isolated. But there is a wider collection of objects involved in relief: in the sphere of nutrition there is not just food, but the charts and tables in humanitarian handbooks, the measuring

tapes used for anthropometry, the ration cards that promise resources, and the invisible nutrients that fortify foods.

In considering these objects, this chapter has examined the arrangements that surround them, not just the objects themselves. Objects are inserted into a procedure, they take part in networks and become involved with people, paper and place. In Yusuf Batil we do not just have maize and soya, or oil and sugar, sitting inertly until distribution. They are broken down into their composite nutrients and set out in charts, or combined and repackaged into a premix, given a label, and accompanied by instructions for correct use. They are surrounded by a distribution procedure, and inserted into an administrative process of measurements and registration. They take part in an outpatient therapeutic programme or a supplementary feeding distribution, with procedures set out in handbooks.

These foods are inserted into the jigsaw of a larger nutritional system, given a place and re-described, changed by their involvement in humanitarianism. The soya and sugar are more than just foods; they become fortified and are redefined as nutrients, medicine, and resources for exchange. The MUAC band is not just a measuring tape; it becomes an efficient mechanism of triage, a system for categorising hunger, and a way of externalising ethical decisions. The ration cards are not just administrative conveniences, but cherished passages to advantage, ways of categorising bodies. When we look at humanitarian objects we do not just look at the food, the MUAC band, and the ration card, but a whole arrangement of practices, linked to people, linked to other objects. In the rest of this thesis, we look in detail at two groups of these objects: in part one, I consider the history of fortified foods; in part two, I look at the history of anthropometric measuring instruments. Before delving into this historical material, however, I will explain my theoretical approach and methodology.

3.

The despised missing masses

Theory, methods and object-oriented research

One of Bruno Latour's most interesting and provocative papers examines a door. The paper begins with a faux-naif celebration of the door's achievements, declaring it a 'miracle of modern technology'. Doors are particularly valuable, Latour argues, because they solve the 'wall-hole dilemma': the twin problems with holes and with walls. The trouble with walls, he writes, is that you need holes in order to get through them; without holes, walls can only produce tombs or mausoleums. But the problem with holes is that *everything* can get in and out of them: dust, noise, cold, wind, cows, rats, burglars, and unwanted visitors, to name just a few. The door offers a way through the wall, and a way of returning it to an impervious state. It converts the impregnability of a wall into the permeability of a hole, and back again – all with relatively little effort. 'Instead of driving a hole through the wall with a sledgehammer or a pick, you simply push the door', Latour writes. 'And once you have passed through the door, you do not have to find trowel and cement to rebuild the wall you have just destroyed: you simply push the door gently back again'.[1]

Latour's point is that the door is so useful because it prevents a huge amount of additional work. To calculate the value, Latour writes, 'you simply have to imagine that every time you want to get in and out of the building, you have to do the same work as a prisoner trying to escape or as a gangster trying to rob a bank, plus the work of those who rebuild the prison's or the bank's walls'. The value of the door is concealed but enormous, encompassing the equivalent work it would take to achieve the same result using other means. In his writings, Latour applies a similar logic to

[1] Bruno Latour, 'Where are the missing masses? The sociology of a few mundane artefacts', in *Shaping technology/building society: studies in sociotechnical change*, ed. Wiebe Bijker and John Law, (Cambridge: MIT Press, 1992), 228.

many other everyday objects: hammers enable us to hit nails into wood, baskets carry many items with greater ease, electric kettles boil water quickly and cleanly. This seems obvious, but each of these objects replaces a greater amount of human effort, and without them our experience of the world would be completely different.[2]

The lesson, according to Latour, is to include objects in social analysis. Objects enable us to do things, but sit unnoticed in the background; they change the way that social life operates in subtle, nearly invisible ways. Objects are, to use his memorable phrase, the 'missing masses' that have been so insistently excluded from social analysis. 'As stubbornly as the human masses in the 19th Century', he writes, 'they knock at the door... requesting a place in accounts of society'. Just as our scholarly ancestors have gradually included the excluded human masses over the past one hundred years, we need to find a place for the 'hidden and despised' *non*-human masses as well, who sit there, waiting, 'begging for understanding'.[3]

In this chapter I justify my attention on nutritional objects, making the case for a Latourian historical sociology. In the last chapter I introduced two of these objects: fortified foods and MUAC bands, which have become central to humanitarian nutrition. In this chapter, I will explain how I studied these objects. At first glance, the combination of Latour and historical sociology seems rather conflicting. Latour, after all, is famous for his relentlessly detailed examination of networks – his obsessively ethnographic approach to enquiry, which takes a 'black box' and opens it up, documenting its component parts and how these all hold together. He has also been criticised for having serious philosophical problems with the passing of time. Historical sociology, in contrast, is anything but ethnographic: it embraces a wide timescale, it identifies sweeping sociological phenomena, and it has the opposite

[2] 'Where are the missing masses?', 228; Bruno Latour, *Reassembling the social: an introduction to actor-network-theory* (Oxford: Oxford University Press, 2005), 71-72.
[3] 'Where are the missing masses?', 227.

problem to Latour, since it has a tendency to elide detailed nuances in order to build a grand theory. It is also, self-evidently, preoccupied with time.

In this chapter I unite these approaches, embracing some elements of Latour, rejecting others, and using his theory in a 'history of the present'. The main impetus for starting with Latour is that his theories attend to the importance of objects. They emphasise how objects shape society, as well as describing how they come about, and what determines their form (the 'construction' of objects). This is particularly important because I am asking how humanitarian nutrition came to be the way it is today. I am interested in the construction of nutritional practices, which, as I argued in the last chapter, have become a standardised arrangement in recent years. But I am also interested in how objects shape these practices. I am interested in how fortified foods and anthropometric measuring instruments fit into these standardised techniques. Finally, I am asking a more conceptual, ontological question, about the nature of objects themselves. I am asking what food and hunger actually *are* for humanitarians, what they have become over the last century.[4] This is not an explicitly Latourian research project, but it is certainly influenced by his thought.

The second half of the chapter looks at the methods of this study. My work is built on documentary research, with a focus on historical journal articles and documents from aid agency archives. Aside from the ethnographic work that was contained in the previous chapter, my work mainly draws on archives, newspapers, and scientific journals. Towards the end of this chapter I describe these sources in more detail, and explain how I read these documents to tell the story of anthropometric instruments and fortified foods.

[4] My research questions are articulated more explicitly in the preface, and the boundaries of my research are delimited in the introduction.

Theory

The discussion of a door with which I opened this chapter is typical of Latour's engaging and polemic style, and it captures one of his most central concerns: the inclusion of objects as an equal party in sociological study. His preoccupation with the material world is what makes Latour such a useful theorist for understanding humanitarianism, because humanitarianism, as I have argued, makes the distribution of objects like foodstuffs, water and shelter an absolutely central part of its activities. Latour's thought is particularly useful because it contains a startlingly provocative set of foundational assumptions. Although much of his work is empirical – embracing a fantastic variety of subjects, from the highest legal authority in France to the utopian attempts to reform the transportation system of 1980s Paris – most of these studies come back to a basic ontological question: what actually exists in the world?

Ontology

Latour's answer to this question is quite surprising, as he relies not on any concept of unchanging essence or foundational physical matter, but centres his account on the creation and maintenance of networks. The world, he argues, is made up of complex associations of diverse and heterogeneous elements, which hold together with various degrees of success. These networks include people, things, ideas, concepts, beliefs, texts, objects – everything, in fact, whether material or immaterial, social or natural, textual or physical, which we talk about, think, see, measure, feel and experience. His answer to the question of 'what exists in the world' is to insist that there is nothing final, nothing fixed at the root of the universe, only a constantly shifting set of alliances, which, at any moment, may disintegrate. This

perspective was first set out in a concise document from the early 1980s called *Irreductions*, and subsequently informed what has become known as Actor-Network Theory (ANT), a body of work developed by Latour alongside some key collaborators, including Michel Callon, John Law, and Madeleine Alkrich.[5]

Actor-Network Theory is perhaps best described as a way of examining how things in the world become large and successful; it seeks to explain what makes various phenomena (objects, institutions, ideas, and so on) particularly stable and long-lasting. ANT would address questions such as what makes some cars more reliable than others? What makes some institutions more powerful than others? What makes some political communities more stable than others? What makes some ideas more popular than others? In each of these cases, ANT views success as a product of *alliances*. All of these things (objects, institutions, political communities, ideas, and so on) are *networks*, consisting of diverse and heterogeneous elements. The more people and things involved in these networks, the more stable they will be. Stability, therefore, is not a state of affairs, but an *achievement*. It is the result of negotiation, which brings various elements together.

ANT starts with the idea that we can pick apart any actor (any entity that makes something happen) and break it down into various component parts – that is, we can see it as a network. Then, we can examine how these various parts function collectively to create an effect, and we can also see how this network is an actor. Everything, in other words, is both an actor (in that it creates an effect in the world) and a network (in that it is an alliance of other elements).[6] If we examine a university,

[5] Irreductions was published in English as the second section of Bruno Latour, *The pasteurization of France* (Cambridge: Harvard University Press, 1988). A more detailed discussion of Latour's ontology can be found in Graham Harman, *Prince of networks: Bruno Latour and metaphysics* (Melbourne: re.press, 2009). For more on ANT, see Latour, *Reassembling the social*; John Law, 'After ANT: complexity, naming and topology', in *Actor network theory and after*, ed. John Law and John Hassard, (Oxford: Blackwell, 1999); John Law and John Hassard, eds., *Actor network theory and after*, (Oxford: Blackwell, 1999).

[6] Harman, *Prince of networks*, 13.

for example, we can see that it is a jumble of parts that work together in a network. The university consists of buildings, rooms, lecturers, administrative staff, headed paper, logos, ideas, publications and computers. It is all these things, and more. We can go on listing the individual elements that make up the university and we can examine in detail how they work together; or, more usually, we treat the university as a single, coherent actor, a single entity that does things: 'the University is changing its examination regulations', or 'the University has a new admissions policy'.

Latour recognises both these ways of seeing the university. On the one hand, we can break the university down into its various parts. On the other, we can look at how these parts collaborate together. Most importantly, this approach allows us to scrutinise the internal workings of a thing. It reminds us that the instruction to alter admissions policies does not just get transferred through the organisation without effort or friction; it requires a massive work of mediation, where agreements are reached, roles are performed, documents altered, and policies put into effect with various degrees of success. ANT is not interested in saying the university is *just* a network, or to somehow question its reality by uncovering its complex network of components. This approach is very different from the often reductive, postmodernist point that the university might be reduced to a social process, a collaborative task – as if the university itself were just a chimera. The university as a whole is still utterly concrete, it still acts in the world, influences other people and things. For example, when my paycheque arrives, there is no doubt it is a product of my employment with the university, even though the actual transfer of funds and production of the paper documents requires a network of computers, staff, printers, human labour, numbers, banks, and postal services to produce the final result.

Latour has often used the idea of a 'black box' to illustrate the shift between these two perspectives. A black box is something whose internal workings have been

concealed, in order to focus on its inputs and outputs. It is a concept used in science and engineering to simplify complex processes, to render opaque the implementation mechanism of some object (say, a transistor or an algorithm), so we can focus on what is actually produced. According to Latour, we treat a great many things as black boxes every day – whenever we take the operations of something for granted. When I receive my paycheque, I do not generally consider the complexity of the payment process: the intricacies of accountancy, auditing, taxation, bank transfers, and the appearance of the payslip in the post. All I do is celebrate that the university has paid me. Of course, I can, in principle, shift perspective; I can, if I wish, deeply contemplate the immense operation that functions in universities, banks, and wider society to bring me my wage, but generally, I do not. I take the paycheque and I go and pay my bills.

The really radical part of Latour's theory is that this model applies not just to institutions like universities, but to *absolutely everything*. Latour makes no distinction between humans and nonhumans, between concepts and objects, between imaginary spirits and concrete paving slabs. He considers everything as both an actor (which produces an effect), and a network of alliances (that work together to produce this effect). As a result, the list of actor-networks is endless and heterogeneous; it includes 'atoms, children, raindrops, bullet trains, politicians and numerals', all which can, in principle, be broken down into their component parts.[7] One of the most important implications of this idea is that everything is made up of other things; everything is defined by its relations. Latour insists that there is no central essence to anything; there is no inner kernel or substance at the heart of things in the world, because everything is no more and no less than the network of relations that make it up.

[7] *Prince of networks*, 14.

To return once again to the university as an illustration, Latour would argue that there is no inner kernel or heart to the university – no central point at which we can say 'this is the essence of the university, whereas these classrooms, lectures, books, managers, subject areas are all peripheral attachments'. For Latour, the university is the sum total of everything that enters into an alliance with it – from books, to staff, to students, to buildings, to government funding bodies and corporations. Latour does not seek a stripped-down final essence to the university, since he claims that everything consists of all the relationships it is embedded within.[8] His central idea is that everything is changed by its relationship with everything else. Everything gets its form through the relations in which it participates. And, to return us to the issue of objects, these relations can take any kind of form: they are material, conceptual, and social; the university is formed as much by its buildings and classrooms as it is by its lecturers, students, and ideas. Latour places everything on an equal ontological footing, which means starting research without making any prior distinction between a world of humans and a world of objects. This perspective can be called *non-modernism*, and was presented most forcefully in Latour's book *We have never been modern*, published in English in 1993.

Non-modernism

We have never been modern started with a series of observations taken from Latour's daily newspaper, stories in which the social and natural worlds seemed irretrievably fused. Going through article after article, Latour observed how they all

[8] The philosophical importance of *Irreductions* is discussed by Graham Harman, who argues Latour offers a strong challenge to Aristotelian metaphysics and traditional substance theory. *Prince of networks*, 16-20.

'mix together chemical reactions and political reactions', and how 'a single thread links the most esoteric sciences and the most sordid politics':

> On page eight there is a story about computers and chips controlled by the Japanese; on page nine, about the right to keep frozen embryos; on page ten, about a forest burning, its columns of smoke carrying off rare species that some naturalists would like to protect; on page eleven there are whales wearing collars fitted with radio tracking devices; also on page eleven, there is a slag heap in northern France, as symbol of the exploitation of workers, that has just been classified as an ecological preserve because of the rare flora it has been fostering. On page twelve, the Pope, French bishops, Monsanto, the Fallopian tubes, and Texas fundamentalists gather in a strange cohort around a single contraceptive…[9]

On and on, Latour writes, recounting examples of the intricate mixing of hybrids, 'imbroglios of science, politics, economy, law, religion, technology, [and] fiction.' Everything is mixed together, so that 'the smallest AIDS virus takes you from sex, to the unconscious, then to Africa, tissue cultures, DNA and San Francisco'. In these fascinating introductory paragraphs, the aim of Latour's book is made clear: he wants to question the simplistic division between 'nature' and 'society', which is too often taken for granted. In the modern world, Latour argues, hybrid entities are proliferating and becoming more and more obvious, from genetically modified foods to animals wearing tracking devices. Yet most of us assume that nature and society can be neatly distinguished, and the pages of our newspapers reproduce this idea, dividing stories into sections entitled Economy, Politics, Science, Books, Culture, Religion and so on, 'as if there were nothing odd going on'.[10]

Latour's central argument in this book is that the world cannot be neatly sliced into what is natural and what is man-made, into physical life and cultural life. 'All of

[9] Latour, *We have never been modern*, 1-3.
[10] *We have never been modern*, 2.

culture and all of nature get churned up every day', he writes, and the world, instead, should be seen as made up of hybrid entities, things that are part social and part natural.[11] The division between society and nature, Latour insists, is an *achievement*, maintained through constant disciplinary work; indeed, it is a foundational achievement of modernity.

In the second chapter of the book, Latour analyses what he calls the 'modern constitution'. First, he argues, modernity is characterised by the scientific domination of nature, which assumes nature exists independently of humans, and can be uncovered objectively. Second, modernity is characterised by the political emancipation of humanity, which assumes that humans can determine their own destiny, and freely shape their lives. According to Latour, these two features are riven with paradoxes. Nature is *not* transcendent, objectively knowable and independent of humanity; it is constructed in our laboratories, and fabricated in our activities each and every day. Society is *not* a purely human construction, created by people acting freely; it is also beyond our control, it limits our action through its structures, and it is made durable by facets of the physical world. This leads us to a third defining feature of modernity, which for Latour is the most significant: modernity maintains a strict purification of these two realms. It divides nature from society, science from politics, and it suggests that the two simply should not mix. Latour's point, in contrast, is that they always mix, and that they actually cannot be purified, because they bleed into each other all the time.

In this passionate polemic, Latour directed his ire at both modernists and postmodernists. These two – admittedly crudely defined – sides, he argued, have collaborated in the enforced purification of nature from society. Modernists, he said, took the view that nature could be accessed independently of social distortions –

[11] *We have never been modern*, 2.

believing that the facts of the world were basically available to human measurement and definition. They held that the world was out there, waiting for us to come and discover it, and ignoring how we actually transform and translate things through our very involvement in the scientific process. But postmodernists, he claimed, held an even more ridiculous position, asserting the impossibility of ever experiencing or understanding the physical world directly. They claimed that our social positioning, language, and culture always skewed our perceptions, and that consequently we could never have true, unmediated access to reality.[12] Both these sides, according to Latour, are at fault for presuming a fundamental distinction between the social and the material worlds – a distinction that, he insists, is created, and not given. What is needed, Latour suggested, is for us all to become *non-modern* instead: to reject the distinction between human and world, nature and culture, the social and the natural entirely, and to view the world as made up of constantly shifting alliances between both human and non-human components.

In many ways, this was not so much a suggestion on a Latour's part, as an imperative. It is impossible, Latour argued, to maintain the modern distinction, because hybridity always intrudes into the most assiduous attempt at purification. Instead, we should attempt to be *non-modern*, denying acts of purification and recognising the impossibility of separating nature and culture completely. To adopt the title of the book, we have never been truly modern, because nature and society have never been truly separate. Later, Latour provided a memorable example of why it makes little sense to separate the world into piles of 'natural' and 'social' stuff. When we examine a battle, he said, we do not create two heaps for separate analysis – a group of naked, even disembodied soldiers on one hand, and a pile of guns,

[12] The way Latour positions himself against 'modernists' and 'postmodernists' can be rather crude, eliding significant differences between many thinkers. Indeed, he can be criticised for setting up straw men on both sides, but it is helpful to think of these labels as extreme poles on a more nuanced intellectual spectrum, against which Latour works through his own position.

uniforms, tanks, bullets and sandbags on the other. The battle is an intricate combination of all these elements, and its outcome depends on relationships between them. Latour's point is not just that people *and* objects determine the balance of forces and the final victor, but that we cannot untangle the way these affect each other. Every soldier is a complex network, which includes material, social and conceptual factors: the gun he carries, the uniform he wears, and the ideas and thoughts circulating are all central to understanding his role. The same is true of the army, which is a network of individual soldiers, plus an array of other things: from strategies to maps, from buildings to concepts, which all need to be included if we are to do the analysis of a battle any justice.

Latour's non-modernism can help explain the importance of the concept of networks – of everything being in a network. Networks are made up of both humans and non-humans, and Latour's continual refrain is that we should not begin by making an a priori division between them. Objects and people are *both* important to events, and neither can be understood in isolation. This approach is neither that of a determinist, who declares that technology and nature shapes society, nor that of a social constructivist, who believes that society shapes the malleable clay of the physical world. It is neither the position of a modernist, who believes that the laws of nature can be independently revealed, nor that of a postmodernist, who believes that nature can never truly be known. This is a bold and radically original position. For all the flaws of *We have never been modern* – its lack of empirical detail, its frustrating generalisations, and its straw men – this is a provocative argument that is great to think with; it is also particularly useful as a lens for exploring humanitarianism, which has made the purification of nature and society such a central part of its mission.

Latour embraced

One of the central arguments in this thesis is that humanitarianism is persistently modern. This is a theme I will return to many times over the coming chapters: that the core practices of humanitarian nutrition were developed and solidified between the 1930s and the 1970s, a high point in modernist thinking. Regarding fortified foods, I trace how these sprung from an obsession with order, control, and efficiency. Regarding anthropometry, I look at how these evolved from the idea of universal man and modern statistical techniques. This adds up to a picture of humanitarian nutrition as a resiliently modernist movement: its contemporary characteristics underpinned by classically modernist ideas. In analysing this movement, my argument is heavily influenced by *We Have Never Been Modern*, in which Latour describes the features of the 'modern constitution', but an important clarification is in order. The title of that book seems to suggest that Latour is arguing modernism never happened, that modernist ideas did not occur in the post-war era. This is absolutely wrong. Latour never claims that modernity as an intellectual movement did not happen; he claims that the assumptions of the modernist movement are false. The phrase 'we have never been modern' describes how humans cannot be the way modernists claim: Latour is arguing that modernist ideas are built on shaky ontological foundations, mistakenly purifying person from object, and society from nature, he is not denying that modernism took place.

So the first Latourian feature of this thesis is its non-modernism: much of what follows clarifies and critiques the modernist qualities of humanitarian nutrition, and can be read as derived from Latour's argument. But this thesis is also influenced by Latour's constructivism. Like most of Latour's work, my aim in this thesis is to take a relatively stable set of practices, and look at how they were built. In the preface I

articulated the starting point of my research through two questions: How have humanitarians measured hunger? How have they provided food? My approach to these questions has been to start with a set of practices (which I illustrated in the last chapter, in Yusuf Batil) and to examine their intellectual and material foundations. In many ways, this is what Foucault's work excelled at, and given my focus on history Foucault would seem a more obvious theoretical starting point.[13] But I am interested in the material as well as the intellectual foundations of humanitarianism, and Foucault's approach is limiting because his work is dominated by discourse, ideas, and *social* constructions. Latour is refreshing because he includes objects and the material world as well as discourse and ideas. Especially in the study of humanitarianism, this seems a far more sympathetic way to proceed.[14]

The point is worth clarifying, because it has been the subject of much misdirected ire: Latour is *not* a social constructivist. He does not limit himself to the study of how things are *socially* constructed; he looks more broadly at how they are constructed from material as well as social practices. This is the beauty of the Latourian philosophy: it is does not accept the common distinction between the material world of objects, and the social world of representations. Mainstream scientific method would say that there is an unchanging world of physical matter 'out there', which we observe and come to know about, suggesting that there is a relatively frictionless passage between reality and our perceptions of it. Postmodernists and poststructuralists would disagree, introducing layers of distortion between reality and

[13] For more on Foucault's historical method, see Mitchell Dean, *Critical and effective histories: Foucault's methods and historical sociology* (London: Routledge, 1994); Michel Foucault, 'Nietzsche, genealogy, history', in *Aesthetics, method, and epistemology: essential works of Foucault, 1954-1984, volume II*, ed. James Faubion, (London: Allen Lane, 1998); Paul Veyne, 'Foucault revolutionizes history', in *Foucault and his interlocutors*, ed. Arnold Davidson, (London: University of Chicago Press, 1997); Jeffrey Weeks, 'Foucault for historians', *History Workshop Journal*, no. 14 (1982). Latour's problem with time is discussed further below.

[14] It is particularly problematic (as well as distasteful) to speak of death, hunger, and pain, as a discourse, although this has not stopped some social constructivists from trying. See Derek Edwards, Malcolm Ashmore, and Jonathan Potter, 'Death and Furniture: the rhetoric, politics and theology of bottom line arguments against relativism', *History of the Human Sciences* 8, no. 2 (1995).

its representation, some introduced by our senses, some by our minds, and some by the instability of language. Latour, however, does not accept either of these ideas. He rejects the idea that there is a simplistic binary division between a physical world of things, and a social world of perceptions, but at the same time he does not accept the postmodern response: that objects in the world are socially constructed, distorted and produced by human representations. His ontological starting point is that objects are defined by *many different relations*, their characters shaped not just by relations with human beings, but by relations with the material world as well.

This brings me to the third main influence of Latour's work on this thesis: his ontological position. Latour's ontology can be summarised by the idea that 'everything is defined by its relations'. The very nature of things, in other words, is defined by what they are connected to. Things are not *socially* constructed, but, in a wider sense, constructed – by a heterogeneous network of material as well as social processes.[15] This is important to my thesis because I am making an ontological argument as well as a historical argument. My central claim is not just that humanitarian nutritional practices were constructed in the modernist decades of the mid-twentieth century; my claim is that the very nature of food changed in this era, as did the nature of hunger. In Latour's terms, these objects – hunger and food – are not unchanging things, out there in the world, waiting for us to discover them; they are constructed through practice and shaped by our attempts to see them.

This idea – of objects constructed through practice – has been more fully explored in the work of Annemarie Mol, a Dutch philosopher who was influenced by Latour, and who has been responsible for the 'ontic turn' in Actor-Network Theory.[16]

[15] This important theoretical clarification led Latour to re-name the subtitle of his breakthrough book, *Laboratory Life*, which was co-authored with Steve Woolgar. It was originally published in 1979 with the subtitle 'the social construction of scientific facts', but the second edition, published by Princeton University Press in 1986 was subtitled 'the construction of scientific facts'.
[16] Steve Woolgar and Javier Lezaun, 'The wrong bin bag: A turn to ontology in science and technology studies?', *Social Studies of Science* 43, no. 3 (2013).

Mol is often considered to be part of the 'after-ANT' or 'post-ANT' school of thought, as she critiqued ANT's tendency to become the study of victories and strength, placing too much emphasis on strategies of the powerful, and not enough on subaltern groups or resistance.[17] Mol's work is less about alliances, strengths, and stable networks, and more about fluidity, multiplicity, and constant change.[18] Instead of accounting for things that are large and successful, she focuses on differences, contradictions, and marginality. One of her most important contributions is to suggest that every object is multiple. In other words, there are not single objects looked at from different perspectives; there are multiple objects, produced by practice.[19]

Mol's book, *The Body Multiple,* articulates this idea most fully.[20] It is a study of how atherosclerosis is 'enacted' in a hospital. Following different specialists in their work, Mol describes how each person understands atherosclerosis differently, how they all use different techniques to see this underlying condition. For the pathologist, an artery is sliced, dyed and examined under a microscope – and what can be seen in the eyepiece comes to define atherosclerosis. For the clinician, a patient comes in complaining of pain in the leg and difficulty walking – and what is observed in signs and symptoms comes to define atherosclerosis. Mol concludes that atherosclerosis is multiple – it is different things for different people. Her approach is to ignore textbook definitions of atherosclerosis, and to concentrate instead on how atherosclerosis is *done - how it is practiced or enacted.* In the pathology lab, atherosclerosis is an abnormal thickness on the inner coating of the artery, determined

[17] Christopher Gad and Casper Bruun Jensen, 'On the Consequences of Post-ANT', *Science, Technology & Human Values* 35, no. 1 (2010); Law and Hassard, *Actor network theory and after*. For other critiques of ANT's fascination with strength, stability, and power, see Susan Leigh Star, 'Power, technologies and the phenomenology of conventions: on being allergic to onions', in *A sociology of monsters: essays on power, technology and domination*, ed. John Law, (London: Routledge, 1991); Nick Lee and Steve Brown, 'Otherness and the actor network', *American Behavioral Scientist* 37, no. 6 (1994); Langdon Winner, 'Upon opening the black box and finding it empty: social constructivism and the philosophy of technology', *Science, Technology, & Human Values* 18, no. 3 (1993).
[18] John Law, 'On sociology and STS', *The Sociological Review* 56, no. 4 (2008): 635-38.
[19] This clearly builds on Latour's idea that things are defined by their relations.
[20] Annemarie Mol, *The body multiple: ontology in medical practice* (London: Duke University Press, 2002).

after physically removing the artery and looking at it. In the clinic, atherosclerosis is a series of observations of the physical body and reports of pain from the patient. Mol's view is that any object is not a singular entity, but a texture of multiple and partially coordinated practices.

Mol is careful to distinguish her approach from what she calls 'perspectivism'. This is the view that there are different *perspectives* on atherosclerosis, but that atherosclerosis is a single, coherent object. Instead, Mol argues that there is not one atherosclerosis looked at differently by each person; there are multiple atherosclerоses. Her aim is not to look at different perspectives on a given thing, but to describe the ontology of a multiple object. It is helpful to think of this in contrast with postmodernism. Postmodernists have managed to 'decentre' the subject, arguing that the subject is split, heterogeneous, and multiple. They have suggested that subjects depend on webs of relations. They have suggested that our subjectivities affect our perceptions of the external world, whilst leaving this world theoretically untouched – as made up of 'timeless essences and absolute boundaries'.[21] Mol's work extends the fluidity of the subject to the material world. Instead of 'decentring' the subject she decentres the object. With a symmetry that is a hallmark of Latourian studies, she suggests that if subjects are split, heterogeneous and multiple, then so are objects, and if subjects depend on webs of relations for their existence, then so do their material counterparts.

In this thesis I use the idea of multiple ontologies to consider hunger and food. I argue that malnutrition is not a singular, coherent entity, looked at differently by different people. It is multiple. Its ontology consists in the various ways it is conceived and understood, which have changed the very nature of the thing. I argue that food is not just perceived differently by traditional societies and modernists, but

[21] Arun Saldanha, 'Review essay: Actor-Network Theory and critical sociology', *Critical Sociology* 29, no. 3 (2003): 422.

food itself is fluid, with many different enactments. To clarify this point once again, I am not just talking here about our *perspectives* on hunger and food; I am not saying that our *ideas* of hunger and food changed – although this is certainly true. My claim is also that the very materiality of hunger and food also changed – what hunger *is*, what food *is* underwent a transformation in the middle of the twentieth century. This was particularly influenced by modernism, which mistakenly extracted the social and political values of food from their material manifestations, leading to new foodstuffs and new types of hunger.

Latour rejected

Latour's ontology is fascinating to think with, but it is also the source of his problems with time. This is the first element of his theory I wish to discard. If objects are defined by their relations, and do not exist independently 'out there' in the world, then it becomes impossible to document their journey through time. Latour, to recap, argues that nothing has an essence, that everything is a network of component parts. But since these relations are constantly changing, so are objects. If we take his theory to its logical conclusion, every object exists only for an instant, whereupon the network that makes it subtly alters. As a result, we cannot trace the passage through time of a stable, already existing substance.[22] This idea is not just insufferably abstract, but impossible to fit into our ways of living. Surely I have to think of the pen in my hand as the same pen as yesterday, even if its location has changed and my use for it is different. In practice, Latour has to think this way as well, since most of his

[22] 'Latour's cosmos is made of nothing but individual actors, events that are fully deployed at each instant, free of potency or potentiality, or any hidden dimensions that lie outside their sum of alliances in any given moment. For this reason, there can be no independent reality known as 'time'… Latour suggests a cinematic universe of individual instants… He holds that time is merely the result of negotiation among entities, not what makes these negotiations possible'. Harman, *Prince of networks*, 30-31.

work concerns how actor-networks become and remain stable. This leaves an underlying contradiction in his philosophy, which encourages him to speak of things travelling through time with some kind of unchanging essence, whilst refusing to accept that such an essence exists.

I make no claim to resolve the underlying tension here, but I think there is a way to make this theory work in practice. After all, it is based on a very persuasive idea: that nothing is final, that everything is constantly changing, and that all objects can be broken down into an almost infinite array of component parts. Rather like Kant's solution to the problem of free will – that we can never truly know if we have free will, but that we must act as though we have it – the best way through this problem is a practical one: we can accept that an object's essence can never be pinned down, but nevertheless we think and act as though they can. To put it another way, we can accept that things are constructed and are constantly changing, but all the same, we need to think of them as coherent wholes with stable essences simply in order to live our lives. If we fail to do this, we certainly cannot even think about history.

This is, I accept, a kind of compromise, but it is a necessary one if we are to use Latour's work in a historical manner. After all, Latour's emphasis on social and material worlds offers a rich vein of enquiry for historians. To illustrate its advantage, consider the approaches of social history and history of science. Social historians suggest that technology emerges from social processes; historians of science look at how society is shaped by technology. Both these approaches can be problematic: histories of science risk a variation of technological determinism, with machines determining the shape of human history, and social histories risk a social bias, with humans determining the material world. Both divide the social and physical worlds into two separate heaps, assuming that one pile drives the other, but Latour offers a way through this – a way of writing history that shows how technological objects,

social life, and intellectual trends all work together to create results. He reminds us that there is no reason to assume that either objects, or people, determine historical change. Of course, social relations may shape machines, and machines may shape society, but matters are usually more complex, involving hybrid elements of both. History, like everything else, can be thought about as though it were a network.

The second element of Latour's theory I wish to discard is his emphasis on meticulous detail. Actor-Network Theory, as I have already suggested, depends on the scrupulous tracing of networks, the detailed exposition of complex interactions. Whether it is a study of transport schemes, missile systems, or political institutions these studies trace such systems in great depth.[23] A Latourian history, one might expect, would have a similar kind of focus. It might be similar to a micro-history, focusing, like Carlo Ginsburg or Emmanuel Le Roy Ladurie on a single person or location, but with the addition of objects and the material world as an equal party in the analysis.[24] In some ways my research resembles such a history, but in other ways it does not. This thesis looks at the micro-level, focusing in great detail on just a few techniques in humanitarianism: the distribution of fortified foods and the use of anthropometric instruments. But at the same time, it examine these practices using a wide historical lens, taking half a century of history and identifying a number of big themes that shaped humanitarianism profoundly.

This expansive time period, the reader might complain, is straying too far from Latourian detail. Its remit is too wide, and its need for generalisations too great. An orthodox Latourian should seek to 'follow' the historical actors and trace their

[23] Bruno Latour, *Aramis, or, The love of technology* (Cambridge: Harvard University Press, 1996); Donald MacKenzie, *Inventing accuracy: an historical sociology of nuclear missile guidance* (Cambridge: MIT Press, 1990); Andrew Barry, 'In the middle of the network', in *Complexities: social studies of knowledge practices*, ed. John Law and Annemarie Mol, (Durham: Duke University Press, 2002).
[24] Emmanuel Le Roy Ladurie, *Montaillou: Cathars and Catholics in a French village, 1294-1324* (London: Scolar Press, 1978); Carlo Ginzburg, *The cheese and the worms: the cosmos of a sixteenth-century miller* (London: Routledge & Kegan Paul, 1980).

relationships in a much tighter timeframe, avoiding generalisations and themes that cut across the decades and influence groups of people.[25] 'If a description remains in need of an explanation, it means that it is a bad description', Latour has written, indicating that historical writing should layer detail on detail, describing in great depth, and eschewing theoretical and analytical diversions that contextualise or explain phenomena.[26] For all but the most detailed micro histories, such an approach is impractical, and it is not compatible with the fundamental aim of this thesis.[27] The very intention of my research is to examine the historical construction of humanitarianism. I need to examine how humanitarian nutrition emerged, how these practices were constructed, how history has shaped our contemporary arrangements. This requires a wider timeframe, rejecting Latour's emphasis on intricate detail in favour of broader trends, whilst retaining a tight focus on just a few nutritional practices.[28]

Finally, I wish to discard Latour's curious ethical ambivalence. His apolitical characteristics have been long recognized, probably raised first by Langdon Winner, who argued that Latour's obsession with 'trials of strength' tended to legitimise existing arrangements of power.[29] This criticism has been reiterated in other forms by those authors who feel Latour lacks an appreciation of less-powerful groups.[30] In general, I feel these critiques miss the point of Latour's project, which is not to offer an ethical position or a set of tools for resistance, but to document something

[25] The idea of 'following the actors' is best explained in Latour, *Reassembling the social*, 11-12, 61, 68.
[26] *Reassembling the social*, 137.
[27] Latour, in fact, wrote one historical book, which was not long enough to be a genuinely micro-historical account (half of the book was heavily philosophical), but which did 'follow the actors' – in this case, microbes and Louis Pasteur. See *The pasteurization of France*.
[28] A good example of historical sociology in a less-explicitly, but relatedly Latourian format can be seen in MacKenzie, *Inventing accuracy: an historical sociology of nuclear missile guidance*.
[29] Winner, 'Upon opening the black box and finding it empty: social constructivism and the philosophy of technology'; For winner's own approach to technology, see Langdon Winner, 'Do artifacts have politics?', in *The social shaping of technology: how the refrigerator got its hum*, ed. Donald MacKenzie and Judy Wajcman, (Milton Keynes: Open University Press, 1985).
[30] Star, 'Power, technologies and the phenomenology of conventions'; Lee and Brown, 'Otherness and the actor network'.

empirical about the way the world works. His aim is not to ethically evaluate the world, but to describe it. Nevertheless, they do point out a gap in both Latour and Foucault's work: that neither author really offers us normative principles by which to live, nor do they give us the tools to condemn practices that have become well-established, but are ethically questionable.

In response to this, I feel there is no reason why a stronger moral content cannot be inserted into a Latourian analysis. After all, Latour's aim – like Foucault's – is to analyse how practices become so dominant. His work examines the stable features of our world, pointing out that they are not inevitable or necessary. This has highly ethical implications. It does not explicitly draw moral judgments, but it allows us to question structures of power. Just like Foucault, Latour is interested in how such structures are built and maintained, disassembling our taken-for-granted ways of doing things.[31] This can act as a springboard for deeper ethical arguments, and in this thesis I have introduced an explicit normative element, which is lacking in a lot of Latour's work. My aim is not just to describe and analyse how humanitarian nutrition operates in emergencies, but also to critique these practices, emphasising how they depoliticise situations, exclude people, and treat human beings as passive recipients of nutritional expertise.

[31] This point has been made in a different form, in John Law, 'Notes on the theory of the actor-network: ordering, strategy, and heterogeneity', *Systemic Practice and Action Research* 5, no. 4 (1992); John Law and Wiebe Bijker, 'Postscript: technology, stability and social theory', in *Shaping technology/building society: studies in sociotechnical change*, ed. Wiebe Bijker and John Law, (Cambridge: MIT Press, 1992).

Methodology

To summarise the argument so far: this thesis is influenced by Latour, but is not a work in the ANT tradition. Latour's thought has shaped my main research questions (which concern the construction of contemporary nutritional practices and the ontology of hunger and food), but this thesis remains a work of historical sociology. It has been influenced by non-modernism, but it is not a detailed study of hybridity in the Latourian mould. It is concerned with the construction of practices, but it examines these over time rather than at a certain historical moment. It reflects on the nature of things, but its ontological conclusions are based more on Mol's work than Latour's. Accordingly, the methods for this study are not drawn from ANT textbooks, which recommend 'following the actor' and describing its connections in intricate detail. My methods are more traditionally historical, focusing on texts in archives – although there is a clear influence of Latour in my approach, which I will explain before going onto discuss my source material in more depth.

Latour made his name as a sociologist of science and as a result, much of his work is devoted to epistemological questions. Particularly in his early work, he is concerned not just with what exists (an ontological question), but also with how we come to know about what exists (an epistemological question). Latour's answers to these questions are similar, because he suggests that scholarly research involves the formulation of alliances. The production of facts, he argues, involves negotiation and networks, just like the production of things. Facts are not sitting out there in the world, waiting to be discovered; rather, facts are constructed as part of the process of doing research. When we seek to know things about the world, we are not just identifying things that already exist; we are intervening in the world, negotiating with them, and creating something new. Our ontological and epistemological questions,

therefore, are linked by the idea that research actually produces what there is in the world. The way we come to know about the world actually changes what we find.

In his earliest, breakthrough book, Latour set out to examine this in a scientific laboratory. Working with the sociologist Steve Woolgar, he spent many months observing some Nobel-prize winning research regarding hormone production in the brain.[32] Latour and Woolgar's observations were published in the book *Laboratory Life,* which was subtitled 'the construction of scientific facts'. This described in great detail how scientific facts were made, from securing funding and training staff, to note-taking and statistical analysis, to writing journal articles and seeking acceptance. Their argument was that facts could not just be grabbed from physical reality; facts have to be painstakingly constructed. To produce a scientific fact, one has to meticulously build alliances, not just with the material world that produces the data, but also with the community of scientists who eventually confer the fact with legitimacy. Latour and Woolgar's study led to the idea that people do not accept facts because the facts are true, but facts are true because people accept them.[33] In other words, the fact does not pre-exist the work of scientists, but the very task of science is to persuade other people that a fact exists – to construct the fact through their work. To avoid confusion and the ire of scientists, Latour then had to clarify that this does not mean scientific facts are in some way imagined. Constructed things, Latour argued, do exist – just look at our surroundings: our houses, offices, desks, computers, and lights. These are all constructed, but to deny their reality would be absurd.

The point here is that methods do not just uncover what already exists in the world; they transform the world through their mediation. In another paper, Latour followed the work of plant scientists in the Amazon basin, showing how botanists

[32] This research, led by Roger Guillemin at the Salk Institute in California, won him the 1977 Nobel Prize in Physiology and Medicine.
[33] This idea is worked on in some detail in Bruno Latour, *Science in action: how to follow scientists and engineers through society* (Milton Keynes: Open University Press, 1987), 12-13.

detached plants from their natural location and transported them home for future reference and further examination. The plant scientists were not just grabbing facts out of the air, but constructing these facts through a complex research process. They were rearranging the world, creating order out of the complexity of the Amazonian ecosystem. Latour writes:

> In the naturalist's collection, things happen to plants that have never occurred since the dawn of the world. The plants find themselves detached, separated, preserved, classified, and tagged. They are then reassembled, reunited, redistributed according to entirely new principles that depend on the researcher, on the discipline of botany, which has been standardized for centuries, and on the institution that shelters them, but they no longer grow as they did in the great forest. The botanist learns new things, and she is transformed accordingly, but the plants are transformed also.[34]

In other words, the botanists were not just observing reality; they were creating something entirely new. The forest was left behind, and its contents were reassembled and reordered back in an air-conditioned room. This, Latour concluded, produced something new, a 'hybrid mixture of science, botany and forest.'[35]

John Law later took up this central idea – that methods are not a window onto reality, but a technique for creating order from reality – in a book entitled *After Method*.[36] Law described how research methods have become dominated by strict procedures, which promise some kind of privileged access to facts about the world. This, Law argued, was highly damaging, because it ignores how our methods produce what we find: determining what we see, how we see it, and how we structure our observations. Law's book was a critique of research methods as a discipline, with its tendency to teach restrictive and inflexible tools, but it was also a rejection of our

[34] Bruno Latour, *Pandora's hope: essays on the reality of science studies* (Cambridge: Harvard University Press, 1999), 39.
[35] *Pandora's hope*, 39.
[36] John Law, *After method: mess in social science research* (London: Routledge, 2004).

dominant ideas about research, in which we use neutral methods to access unchanging truths about the world. Like Latour, with whom Law had collaborated, this book had a radically egalitarian underpinning, which sought to demystify the research process. Law suggested that the researcher is not necessarily more knowledgeable than the person being studied; she just has a set of methodologies that produce order out of the chaos of available sources. In the end, this produces just a *version* of reality, but it can never capture the world in its true complexity.

Most historians would doubtless agree with this reading of the research process. After all, their job is to create some ordered narrative or argument. Faced with countless sources, and a multitude of interpretations of any given event, they have to produce an account of the past that is clear, readable, and persuasive. All the same, their version of historical events will always be open to dispute. As John Tosh has pointed out, more representations can always be sought to add to our understanding of history, further clarification is always possible, and the process of interpreting representations is, in principle, endless.[37] But the aim, in any case, is to try and produce a defensible account of the past, to construct a persuasive narrative from the complex mass of information available. To do this, historians have to be selective, but this does not mean that 'anything goes'. In contrast to the more extreme views of Hayden White, we cannot create any kind of narrative about the past, and what we write has to be supported with evidence.[38]

This is my own approach in this thesis: to construct a plausible, ordered narrative out of the mass of historical information available; to draw out some themes from the archives I have studied, and to convince the reader of my version of events.

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[37] John Tosh, *The pursuit of history: aims, methods and new directions in the study of modern history* (Harlow: Pearson Longman, 2006), 178. For a fascinating discussion of absences in historical narrative, see Michel-Rolph Trouillot, *Silencing the past: power and the production of history* (Boston: Beacon Press, 1995).

[38] Hayden White, *Metahistory: the historical imagination in nineteenth-century Europe* (Baltimore: Johns Hopkins University Press, 1973).

My aim is to construct a compelling story about the history of humanitarian nutrition, told with a focus on objects – looking at the food distributed, and the techniques that measure hunger. Yet I do not claim to have the final word on any of this. My version of events is backed by evidence, but, like all research, it remains open to contestation. Like a black box, it can always be reopened, to see how the facts were created. In a moment, I will explain the sources I used, but I want to emphasise again how this rather mainstream approach to historical research is perfectly compatible with Latourian theory. Historical facts cannot be plucked from thin air, but must be painstakingly constructed from raw source materials. Historical facts need to be supported with sources, which can be seen as 'allies' against rival interpretations. To adopt the lovely Latourian phrase, people do not accept historical facts because they are true. Historical facts are true because people are persuaded.[39]

Methods and sources

The evidence I draw upon can be divided into six main categories: (1) participant observation in South Sudan, (2) correspondence and meeting minutes from aid agency archives, (3) handbooks, manuals and policy guidelines (4) historical newspapers and journal articles, (5) relief worker memoirs, and (6), interviews with retired humanitarian practitioners. Along with some extensive secondary literature, these are my allies. A full list of the archives visited and materials consulted can be found at the end of this thesis.

[39] Indeed, my aim in this thesis is to persuade the reader – a perspective rather reminiscent of E.H Carr, who suggested that a historical fact is not just determined by its source material, but also by its publication and uptake amongst other historians. In other words, it is the act of persuading people that really contributes to the corpus of historical fact. Edward Hallett Carr, *What is history?* (London: Penguin, 1987).

Participant Observation

The purpose of my fieldwork was to build a picture of contemporary humanitarian nutrition.[40] I was interested in how nutritional systems worked, and, in particular, in how these intersected with what was written in policies and handbooks. In selecting my field sites I was driven by my need to observe a recent emergency, and in the summer of 2012 there were very few new emergencies I could visit. Several were unsuitable due to security, language, and logistical constraints (Mali being one example), so in the end I decided on Za'atri refugee camp in Jordan, and Maban County, South Sudan. These seemed good locations because I had experience of the Middle East and Sub-Saharan Africa, I spoke a little Arabic, and both crises were very recent, still experiencing a rapid increase in refugee numbers.

My intention in Maban was to observe supplementary and therapeutic feeding, whereas my aim in Za'atari was to observe voucher and cash transfer schemes. The purpose in visiting both was to illustrate the diverse approaches of humanitarian nutritionists, but in the end I narrowed my focus to anthropometric measurement and emergency feeding. This decision was dictated partly by time (I had to limit my focus in order to study the evolution of practices in detail), partly by relevance (anthropometry and supplementary feeding remain the dominant approach in emergencies), and partly by historical interest (cash and voucher schemes have less history to explore). In the end, I did not use any of the material gathered in Za'atari; in fact, I concluded that the situation in Za'atari could not really be considered a *nutritional* emergency at all, since malnutrition was rare and emergency procedures were not being employed.

[40] My M.Phil thesis was based on these handbooks and guidelines, so I arrived in the field with great familiarity.

In approaching my fieldwork I began by emailing as many people as possible (sourced through academic and practitioner contacts), asking for their assistance in travel and accommodation. After extensive correspondence, I received agreement from a major international aid agency to live in their Maban compound and observe their nutritional programmes, and from UNHCR for assistance in Jordan. Communicating my aims was straightforward, since many aid agencies were interested in the differences between 'best-practice' guidelines and everyday work in the chaos of a new emergency. My contacts in South Sudan were particularly useful, as the humanitarian organisation agreed to provide flights to the remote region, as well as accommodation and food. They offered their support on condition that the organisation remain anonymous in all my writings, and that I would pay the costs of my visit, as well as taking care of my own insurance and security.

I had complete freedom during my period in Maban, and my supporting aid organisation placed me under no obligation to produce 'relevant' policy research in return. I was more of an observer than a participant, although I did help out every day, often with labouring, such as clearing sites and mixing food. I spent each day 'shadowing' a different member of the nutrition team: participating fully in their daily routine, travelling with them to and from the camps, and attending meetings (except senior management meetings). I recorded a number of formal interviews with the staff I shadowed, but the most interesting insights came from working the same long days, eating the same repetitive meals, and conducting as many informal conversations as I could.

During my observations, I kept three basic questions in the forefront of my mind. First, I was concerned with how nutrition programmes were implemented: what actually took place in Yusuf Batil as part of the food distributions? Second, I was interested in the role of objects: what objects were being used in this process and

how? Third, I was interested in the experience of the refugees: how did the recipients understand and engage with the nutritional system? The last question was the hardest to answer, and two main factors limited what I could say. The first was time: I was in the region for only two months, so it was impossible to come to a full understanding of local cultural practices. The second was translation: many refugees could not speak Arabic and since I did not have an Ingessana translator, I relied informally upon older men, who translated from Ingessana to Sudanese Arabic, whereupon my own translator converted the Arabic into English. In this process, it often became very difficult to work out whose perspectives were being passed on, especially as my appearance in the camp would lead to the arrival of many curious people (mainly men), who would interrupt with their own perspectives.

I would have loved to gather more material on local experiences and perceptions of humanitarian nutrition, but my inability to do so did not detract from the purpose of this research, which was to understand the process of relief a bit better. As should be clear from the previous chapter, I was also able to look at how the system 'broke down' in various ways, where the ostensibly objective process was opened up and questioned by refugees. I was also able to produce an illustration of contemporary relief, as a starting point for the historical work that followed. Any concerns about the representativeness of my fieldwork experience can be allayed by the humanitarian handbooks, which recommend a structure for therapeutic and supplementary feeding that closely mirrors my findings in Maban.[41] The elements of my narrative where the process was being pushed against, challenged, or improvised were certainly specific to Yusuf Batil, but it is likely that such inconsistencies and experiences would also exist, in a different form, anywhere nutritional programmes of this nature are carried out.

[41] See, for example, World Food Programme, *Food and nutrition handbook*; World Health Organization, *The management of nutrition in major emergencies*.

Correspondence and meeting minutes

Looking into *historical* practice began in the archives. Between 2010 and 2013 I visited a number of aid agency archives in the UK (the full list is included in the references), and one of the main sources I relied upon was correspondence, memos and meeting minutes. These made up by far the majority of the material, especially during what I came to think of as the 'golden age' of aid agency archiving, which began when many agencies became directly operational in the middle of the 1960s, and ended in the 1990s, when disposable and rarely-archived emails began to replace the meticulously carbon-copied letters that had been the staple of previous years.

When reading the correspondence between aid workers, my technique was, once again, to approach the sources with a number of key questions in mind. First, to uncover historical practice: what are the aid workers actually doing in this particular instance? Second, to focus on objects: what kind of foods and measuring techniques are they relying upon? Third, to think about intellectual foundations: what ideas and assumptions are underpinning these humanitarian operations? This last question became more important in conjunction with other sources, and the main use of correspondence was to uncover what aid workers actually *did*.

By sorting the letters and telegraphs chronologically, I could gain a good sense of humanitarian activities. A good example can be found in chapters five and six, when I describe a leaf protein project in Nigeria. This was based on the remarkably comprehensive Christian Aid archives, which are held in the SOAS special collections, and consisted of letters between desk officers in London and employees

of partner organisations in Nigeria.[42] For the leaf protein project, these letters filled several fat files, and were described by one of the project workers as 'the most voluminous correspondence in West Africa'.[43] Such detailed correspondence enabled me to piece together how leaf protein was used in humanitarian programmes, but also – and more crucially for my argument in chapter six – to see how its promotion was driven by commercial techniques, which were closely associated with the promotion of baby milk.

In general terms, the advantage of correspondence was its vivid and meticulous detail. Aid workers wrote with quite startling honesty about the problems and pitfalls they encountered, as well as the personality clashes and politics of the agencies. In chapter six, for example, I discuss the Oxfam Supro project, which featured pages and pages of correspondence written by the Nairobi-based field director, explaining the failures of the project and justifying the project to his superiors. This provided a great deal of information for my research, but it is also illustrates a key drawback with the source: it frequently offered a biased or exaggerated version of events. The accounts in these letters tended to either inflate or play down certain elements of the project, and it seemed clear to me that the Oxfam director was playing down the failures of the Supro project, partly because it was 'his baby' (he was leading on it from the very start), and partly because subsequent events revealed the project to have systemic flaws (the Supro project folded after only a year of operation).[44]

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[42] I also used these materials to write a separate journal article, which is appearing in a forthcoming (2014) issue of *Development in Practice,* entitled: 'How projects rise and fall: the lifecycle of a dietary modernization scheme'.

[43] Memo from Bridget Walker (Christian Aid desk officer) to Carlisle Patterson (her successor), dated 3/11/1977, file CA4/A/2/11, Christian Aid Archives, SOAS Special Collections, London, UK.

[44] In contrast, some of the letters in the leaf protein archive exaggerated the *difficulties* of the project. There were clear personality clashes at the University of Ife, which led one member of staff to issue damning reports before leaf protein even had a chance to fail (failure, in this case, took nearly a decade). See, for example, letter from Professor Howat (University of Ife) to Valerie Ferguson (Christian Aid), 31st December 1971, Christian Aid archives file CA4/A/2/10, SOAS special collections, London UK.

Taking account of these facets still enabled me to build a good picture of what humanitarians were doing in their various nutrition programmes. These sources were especially useful when combined with the minutes from project committees or organisational boards.[45] Such meeting minutes helped me find out what was actually decided, as well as revealing interesting insights about the decision-making process. They also helped reveal the key themes – such as modernism – that shaped humanitarian nutrition. For example, the Supro project can be more easily situated as part of high modernism when one knows that the Oxfam board was considering a number of other modernist projects at the time, such as investing in Single Cell Proteins derived from petrol. Even when meeting minutes do not reflect what actually ended up happening, they can provide some intellectual context and justification for the decisions that were made.

Manuals and handbooks:

I also drew on manuals, handbooks and policy documents from the archives. These provided an insight into dominant approaches, as well as revealing the preoccupations of aid staff. A good example can be found in chapter four, where I build a picture of post-war approaches to nutritional relief. I argue that humanitarian workers after World War Two were preoccupied with control, order, and efficiency, as revealed in the training manuals used by Quaker service personnel and the handbooks issued by agencies like the Council of British Societies for Relief Abroad. Such handbooks showed a concern for ordered and intricately managed responses, as well as carefully calculated rations, which has endured to the present day.

[45] Often these meeting minutes summarised correspondence, which was very useful for me, although such summaries generally omitted the vivid detail, and were sanitised to present to seniors.

Like historical correspondence, these sources were also useful to find out what happened in the past: what humanitarians did, and what objects they used. There was, however, a more distant relationship to actual practice. Whereas letters – however selective and exaggerated – described what had taken place in the field, policies and handbooks set out what *should* be taking place. The main critique of these sources is that they did not really shape humanitarianism because they represented an idealized procedure, which was of little use in the chaos of disaster. Moreover, there were surprisingly few handbooks and guidelines in the aid agency archives. I found that such policies did not really exist in any great number before the 1970s, and even then they did not survive. A number of archivists told me that instructional, everyday texts tend not to be archived, as they are seen as less important than correspondence between staff and communication from the directorate.

All the same, these documents had their uses. They may have represented an unrealistic and inflexible perfectionism (something one interviewee described to me as a 'sclerosis of thinking'), but humanitarian staff regularly used them.[46] Moreover, organisational policy documents are not built on pure idealism: they are often a distillation of current techniques, a summary of approaches that have been deemed worthy of replication by more senior policymakers. These documents, therefore, tell us something about dominant ideas for providing food at any given moment, at least amongst the humanitarian agencies that issue them. In chapter four, for example, I look at post-war aid manuals, which revealed how many humanitarians favoured a strict and ordered distribution, representing recipients as incapable of reason, driven to frenzy by thoughts of fatty pink spam. Similarly, the mid-1960s nutritional manuals, which I examine in chapter eight, reveal a system of measuring hunger on the body, which did not exist in handbooks from the 1930s.

[46] Interview with Peter Wiles, former humanitarian manager at Save the Children and Oxfam, 30th July 2012.

Aid worker manuals may not be the best guide to what actually happened in the field (for this, we must look at the personal correspondence), but they are an excellent source for interpreting the dominant intellectual trends and ideal-type approach that underpinned these activities. In Latourian terms, they are also of interest because they construct what humanitarian workers see around them. They are of interest not because they accurately *reflect* the world, but because they help to *make* the world. In the words of David Armstrong, who examined medical textbooks from the past 200 years to look at how they formed the objects and subjects of medicine, these plans and policies do not so much represent what humanitarians see; they *produce* what is seen. Armstrong used a lovely example in one of his books, speaking of the anatomical atlas, which, when it emerged, transformed how medics viewed the body. In his words: 'the atlas enabled the anatomy student, when faced with the undifferentiated mass of the body, to see certain things and ignore others. In effect, what the student sees is not the atlas as a representation of the body, but the body as a representation of the atlas.'[47]

Newspapers and journals

Correspondence helps understand what humanitarians do, handbooks help understand why they do it, but journals help understand the objects themselves. Many aid archives contain very little detail on the foods or technologies that were used, but mid-century scholarly journals can help to plug this gap. After discovering that aid workers used something called protein hydrolysates, for example, I turned to scholarly journals to find more information about this object and its history in chapter four. Similarly, I used historical journals to provide more detail on foods from algae

[47] David Armstrong, *Political anatomy of the body: medical knowledge in Britain in the Twentieth century* (Cambridge: Cambridge University Press, 1983), 1-2.

and petroleum in chapter five, and throughout part III I used them to show how doctors measured starvation.

In each of these cases, scholarly journals offered information about the development of new technological product that was lacking in the aid agency archives. After all, humanitarians themselves did not develop most famine foods and measuring instruments. Scholarly journals provided me with information about the ideas that underpin these objects, as well as the circumstances from which they emerged. In some ways, they were problematic as sources, especially when they tended towards a pitted or heroic narrative. But careful reading and consideration alongside other historical materials helped to extract a different story. In my account of kwashiorkor in chapter seven, for example, I offer a challenge to the conventional historiography surrounding Cicely William's discovery. Drawing on the scholarly papers of Williams and her interlocutors, I argue that they reconceived this condition very narrowly as a nutritional deficiency, extracting its more local, social meanings. This came from a critical reading of their scholarly papers alongside biographical sketches in secondary sources, providing a context that was unavailable in the aid agency archives alone.

In addition to scholarly journals I also drew on daily newspapers, particularly the *New York Times*, *Washington Post*, London *Times* and the (Manchester) *Guardian*. These sources showed how technological ideas were more popularly received. Many of the stories in these newspapers were extremely sensationalist: their coverage was often driven by the need for a 'good story', and they did not cover technologies without some kind of reason or 'hook' (often it was the trope of the mad scientist, the novelty of a dehydrated meal, or the shock of skeletal bodies).[48] But

[48] See, respectively, the reception of Single Cell Protein in the *New York Times*, covered in chapter five, the reporting of Multi-Purpose Food in Life magazine, also in chapter five, and the photos of subjects from the Minnesota Starvation Experiment in chapter seven.

despite this bias and selectivity, popular newspapers provide context to the story of modernist foods or research into hunger, also providing colour to the narrative. They may be unreliable sources on their own, but combined with other evidence they provided a richer sense of developments, and can tell us a great deal about the wide societal concerns of the age. The fact that Single Cell Proteins received a lot of newspaper coverage, for example, shows us a great deal about the hope of modernism, and concern for an efficient, reliable food supply. It also helps piece together the bare bones of the story – such as who did what, when – which are not always included in the (rather limited) secondary literature on such 1960s modernist schemes.

Autobiographies and memoirs

Memoirs are another source that can be problematic from a factual perspective, but which became very useful in capturing subjective experiences. I used this source particularly in chapter four, when discussing humanitarian work during the Second World War. The problem with such sources is that they are highly personal narratives, often written several years after the event. They are very selective, and they tend to focus on events that were remarkable or memorable, rather than everyday. Many were written in a deliberately novelistic style – the post-war memoirs of Hulme and McNeill are excellent examples – which lead to accounts that are overly colourful, perhaps even exaggerated.[49] As purely factual accounts of aid work in the Second World War, therefore, these sources leave a great deal out and may be unreliable on their own. Yet the value of these sources is that they reflect the concerns

[49] Margaret McNeill, *By the rivers of Babylon: a story of relief work among the displaced persons of Europe* (London: Bannisdale Press, 1950); Kathryn Hulme, *The wild place* (London: Frederick Muller, 1954). McNeill even called her book a novel, whilst arguing that it was all based on real people and direct experiences; the label allowed her to rearrange events into a smoother narrative – something many diarists do without acknowledgement all the time.

of humanitarian workers. They describe events that preoccupied or concerned the aid community, and, especially when taken together, can be used to draw conclusions about how agencies approached certain problems. In chapter four, for example, I use them to demonstrate how aid workers were very much concerned with preventing the 'misuse' of resources, as well as showing what their sense of 'misuse' entailed.

These sources are also useful in bringing humanitarian nutrition to life. Like newspapers, they are vivid and colourful, whereas archival materials tend to be dry and procedural. There are a great deal of meeting minutes, fundraising appeals and store inventories in the aid agency archives, and boring diktats from senior managers have far more chance of survival than documents produced by field workers. This makes memoirs a valuable source in getting a sense – however partial – of activities in the field. In my account of kwashiorkor, for example, I drew mainly on scholarly journals to see how hunger was 'made visible', but biographies of Cicely Williams (which feature large chunks of personal recollection), were very useful in bringing this story to life: describing what she did, how she came to her conclusions, and the battles she fought on the way.

Interviews

Finally, my research has used a small number of interviews with retired humanitarian practitioners. Over the course of this research, I interviewed eleven people, usually for around two hours each. The questions I asked each person varied greatly, but they generally reflected the person's own historical experiences: the oldest interviewee I spoke to had worked in Biafra, and the younger ones were active in the 1980s. Although these interviews yielded a great deal of interesting material, I have not cited them in the chapters that follow because very few people spoke of the

period I am interested in, and I could find very few humanitarian workers who were active before 1970.

Nevertheless, my interviews did help me by offering leads and suggestions for research. Two independent interviewees, for example, suggested I looked into the history of the Royal Army Medical Corps, because they had heard that many therapeutic feeding technologies were first tried in Belsen. In the end, I found that this story was apocryphal, as the experiments in Belsen were a resounding failure and did not directly shape feeding techniques that followed, but this the archives told an interesting story nonetheless, which captured the military-medical paradigm of the immediate post-war period. Another interviewee gave me ideas for my chapter on high modernism, reminiscing about fortified flours and suggesting I looked into the enrichment of staples with lysine. Again, this was material I had not considered, so rather than being a key source for my narrative, the interviews ended up providing new openings and avenues for my archival research.

Conclusion

The challenge of object-oriented research is making objects 'speak', something particularly difficult when researching the past. More conventional ANT studies 'follow the actor': directly observing objects in their intersection with society, but when writing history, such direct observation is impossible. We have to rely on other people's words, which not only places them at some remove from the researcher, but also mediates the objects through human perception. The key thing, therefore, is to appreciate that objects are important and to write them into our narratives. We need to understand that objects are historical actors just like people.[50]

[50] The Latourian term is 'actant', which is designed to be more inclusive, but I have avoided it, since in most cases it introduces unnecessary jargon.

Humanitarians rely on many different objects, from fortified foods to MUAC bands, and just as Latour wrote of the soldiers in battle, it does not make sense to create two heaps for separate analysis – a group of naked, even disembodied aid workers on one hand, and a pile of MUAC bands and fortified foods on the other. Humanitarianism is an intricate combination of all these elements, and its outcome depends on relationships between them.

This chapter has made the theoretical case for attention to objects, whilst laying the groundwork for two of my central arguments. By adopting Latourian non-modernism, I critique the division between the 'humanitarian' and the 'political', arguing that the objective facts of human need cannot be separated from the politics of research into of hunger, and the development of fortified foods cannot be isolated from modernist human enthusiasms. I also make an ontological claim: that 'hunger' and 'food' are not fixed, but are constituted by their relations, arguing that the very nature of these objects are determined by their connections, and during the middle of the twentieth century, these connections were transformed. Both these arguments emerge from a Latourian theoretical stance. My aim is partly to establish how politics enters into seemingly objective humanitarian procedures, but also to argue that the very nature of hunger and food have been shaped by these complex relations. Before returning to these theoretical arguments, however, I will present some historical narrative, showing how fortified foods were determined by three central themes: militarism, modernity, and the market.

PART II

PROVIDING FOR THE BODY

INTRODUCTION TO PART II

On 30th May 1967, the military governor of Nigeria's Eastern region declared independence for a new state: Biafra, a homeland for the Igbo. Over the previous six months, the Igbo had been the victims of massacres, and many had fled back to the Southeast of Nigeria in what became known as the 'great ingathering'. Sympathy for the Igbo was strong internationally, but secession was not: with the founding of the African Union, states had agreed to respect existing boundaries as a cornerstone of post-colonial order on the continent, and the Nigerian army was widely supported within Africa when it moved to retake the territory. But whilst the conflict was predicted to be rapid and inconsequential, with little media interest in the early days, this was to become a bitter civil conflict lasting nearly three years, into which aid was deeply embroiled.[1] After a military blockade was imposed on Biafra and food supplies dwindled, emaciated children filled newspapers and television screens in the West. The aid agencies created an air bridge, flying relief supplies into the blockaded territory and sustaining the breakaway state, as well as providing publicity and cover for arms deliveries. As the two sides dug in, the 'bush war' became a propaganda war, and the aid agencies, sometimes willingly, sometimes unwillingly, emerged as a key ally for the Biafran cause.[2]

Biafra is often considered the birth of modern humanitarianism. It was one of the first civil wars in independent Africa, testing the capacity of aid agencies to work

[1] The BBC, for example, dispatched an inexperienced journalist (pre-*Day of the Jackal* Frederick Forsythe) to cover what it predicted would be 'a seven, maybe a ten-day bush war'. Paul Harrison and Robin Palmer, *News out of Africa: Biafra to Band Aid* (London: Shipman, 1986), 11; Frederick Forsyth, *The making of an African legend: the Biafra story* (Harmondsworth: Penguin Books, 1977).
[2] For more on the Biafran conflict and humanitarian aid, see John De St. Jorre, *The Nigerian civil war* (London: Hodder and Stoughton, 1972), 233-53; John Stremlau, *The international politics of the Nigerian civil war, 1967-1970* (Princeton: Princeton University Press, 1977), 238-52; Barnett, *Empire of humanity*, 133-47.

across military lines.[3] It featured the 'paradox' of humanitarian action, as the provision of aid had negative consequences.[4] It led to televised appeals, featuring famine imagery and a close relationship between aid and the media.[5] It launched the cult of the aid hero, as young idealists sought glory on the battlefield without becoming allied with power.[6] It spawned new humanitarian organisations, such as MSF and Concern, and established what De Waal calls the 'humanitarian international': a professional cadre of workers who moved from place to place, from Biafra to East Pakistan, Cambodia and Ethiopia, developing new institutions as they went.[7] The Biafran war also saw the first significant challenge to the principle of neutrality, marking the start of 'new humanitarianism' – a more interventionist and explicitly political type of aid, which challenged the traditional authority of the Red Cross.[8]

The Biafran war was influential for many reasons, but for the purposes of this study, it was important because it established a great many nutritional procedures. When faced with widespread starvation and limited resources, aid agencies developed techniques that have now become standard: a two-pronged approach, which involved assessment, followed by food distribution. Agencies used anthropometry to determine the needs of the Biafrans, lining children up and measuring their bodies. Then, they used Fortified Blended Foods to feed the Biafrans, doling out fortified, pre-cooked meals. The rest of this thesis tells the story of these techniques, in which the Biafran war stands as a turning point. This was a moment when contemporary practices of aid

[3] David Forsythe, *The humanitarians: the International Committee of the Red Cross* (Cambridge: Cambridge University Press, 2005), 62-68.
[4] Terry, *Condemned to repeat?*
[5] Jonathan Benthall, *Disasters, relief and the media* (London: I.B. Tauris, 1993), 92-108; Harrison and Palmer, *News out of Africa*, 5-39.
[6] In Gourevitch's words, the post-'68 generation found a way, just fifteen years after Auschwitz, to take action 'with clean hands – healing hands'. Philip Gourevitch, 'Alms Dealers: Can you provide humanitarian aid without facilitating conflicts?,' *The New Yorker*, October 11 2010, 104.
[7] De Waal, *Famine crimes*, 65-79.
[8] Chandler, 'The road to military humanitarianism', 683-86; David Chandler, *From Kosovo to Kabul and beyond: human rights and international intervention* (London: Pluto Press, 2006), 29-31.

emerged in their embryonic form, when intellectual trends solidified into concrete, institutional practices. When telling the history of humanitarian nutrition, it can be seen as the beginning of a new regime, a pivot in our narrative. One of my central arguments is that our current humanitarian regime was forged in the thirty year period after World War Two, with Biafra as it cumulative moment.

The next three chapters concern the first element of this regime: the delivery of food. It was in Biafra, in the late 1960s, that humanitarian agencies experimented with specially produced, nutritionally balanced products, promising miracles in a silver packet. These were distributed in organised spaces under thatched coverings, very much like more recent arrangements in Yusuf Batil. The approach in Biafra is best illustrated through the medical journals of the time, which contain some vivid field reports and descriptions of relief work. An article in the *Lancet*, for example, describes the process adopted in the central Biafran hospital:

> A simple mat-covered shelter with rows of fixed bamboo benches was erected in the compound. The children and their mothers assembled at 7 a.m. and during the next three hours were seen by two very experienced sisters, who handed out cards measuring 15 x 10 cm giving the patient's particulars, the date of attendance, and so on… The child proceeded to two tents in one of which food (i.e., made-up skimmed dried milk or a soya-bean/maize-milk mixture) was dispensed, whilst, in the other, hospital employees handed out the required medicaments.[9]

This system revolved around the distribution of fortified food mixtures.[10] The soy-maize-milk mixture was known as CSM, or Corn-Soy-Milk, produced from agricultural surpluses in the United States and channelled via Unicef to Biafran

[9] Bruno Gans, 'A Biafran relief mission', *The Lancet* 293, no. 7596 (1969): 661.
[10] Maggie Black, *Children first: the story of UNICEF, past and present* (Oxford: Oxford University Press, 1996), 280; Aaron Ifekwunigwe, 'Recent field experiences in Eastern Nigeria (Biafra)', in *Famine: a symposium dealing with nutrition and relief operations in times of disaster*, ed. Gunnar Blix, Yngve Hofvander, and Bo Conradsson Vahlquist, (Uppsala: Almqvist & Wiksell, 1971).

territory.[11] In addition, Unicef had developed a mixture for the most malnourished: a blend of skim milk powder, sugar, and casein (the protein found in milk), which became known as K-Mix-2.[12] These formulae were the mainstays of the feeding programme in Biafra: CSM as a supplementary food, and K-Mix-2 as a therapeutic food. In the words of Maggie Black, this programme 'was one of the first instances where a child-nutrition programme in emergency circumstances was run on a truly scientific basis'. The aid workers, she continues,

> ... measured the children's upper arm circumference with what was known as a 'QUAC stick'. They dispensed rations of milk powder and CSM mixed with local produce… A distinction was made between the various states of malnutrition, and, according to the diagnosis, the child was hospitalised for feeding with K-Mix-2, treated as an outpatient with CSM, or enrolled at a programme in a school or health clinic, where the mother received advice and supplementary rations.[13]

There are many similarities between these accounts of Biafra and my earlier descriptions of contemporary aid (see chapter two). Indeed, by the late-1960s the core features of contemporary nutritional intervention had taken an embryonic, but remarkably recognisable form. The queues under simple wooden constructions, the ration cards and distribution tents, the careful organisation of space, the division between therapeutic and supplementary foods, and, most importantly, the use of fortified blended flours (based mainly on maize meal, soya, and dried skim milk) – we can see these in Biafra just as they are noticeable in Yusuf Batil. My task now is to consider the emergence of this system. In the next three chapters I tell the story of emergency foods, focussing on the period between the 1930s and the 1970s. The aim,

[11] Black, *Children first*, 271-84. See also the interviews in the Unicef History Project, particularly the interview with Strahinja Bacic and Edmond Bridgewater, available in the Unicef archive and digitised online, reference CF/RAI/USAA/DB01/HS/1996-0072.
[12] K-Mix was an abbreviation of 'kwashiorkor mixture'. Ifekwunigwe, 'Recent field experiences in Eastern Nigeria (Biafra)', 152-54.
[13] Black, *Children first*, 280.

in Latourian terms, is to open the ‘black box’ of technology: to look into the past for the antecedents of Plumpy’nut and Corn-Soy Blend. In this story I will emphasise how food became redefined as nutrients, and I will identify three core factors that shaped the form of contemporary humanitarianism. The first of these is the influence of military practice.

4.

Controlling spam-maddened adults

Military practice and emergency foods

Kathryn Hulme is best known as author of *The Nun's Story,* a novel about a Belgian nun who is torn between her religious duties and her personal aspirations. The book ends during the Second World War, when the novel's protagonist, Sister Luke, leaves her convent, choosing loyalty to the resistance over loyalty to the Church. In 1959, *The Nun's Story* was turned into a successful film starring Audrey Hepburn, and was nominated for eight Academy Awards, establishing Hulme as a celebrated author in the United States and a prominent Catholic commentator. But there was a lesser-known element of Hulme's biography, without which the book, and the film, would not have existed. After the Second World War, Hulme worked for the United Nations Relief and Rehabilitation Agency in Germany. She was a relief worker, and managed a displaced persons (DP) camp in Wildflecken. She met a Belgian nun, whose life became the basis for the fictional character. Her wartime experiences were also written into an earlier, 1953 book, which won the *Atlantic* non-fiction award, and provides some rich insights into post-war relief.[1]

This memoir, *The Wild Place*, is filled with vibrant characters and vivid descriptions. It begins with her arrival at Wildflecken, where people had been 'rounded up under whatever roofs had been left intact, usually the roofs of the great Wehrmacht army barracks'.[2] It depicts the displaced standing in carriages, their 'haggard faces shawled, bonneted, turbaned, or simply wrapped around with shreds of

[1] Hulme's relationship with the Belgian Nun, Marie Louise Habets, is documented in her papers, YCAL MSS 22, kept at the Beinecke Rare Book and Manuscript Library, Yale University, USA. Their relationship was dramatized in a BBC radio play by Zoe Fairbairns, *The Belgian Nurse*, broadcast on 13th January 2007. *The Wild Place*, featuring her wartime experiences, was published in 1953 and won the Atlantic non-fiction prize that same year.
[2] Hulme, *The wild place*, 6.

old blanket wool'.[3] It describes the process of registration on arrival, when the refugees were given identification cards, rations, and dusted by DDT squads in what became known as the 'human laundry'.[4] Hulme's memoir also contains a particularly lovely account of food. After struggling to requisition food from the German authorities, Hulme received a visit from an American sergeant, with a trainload of surplus army rations. Each neat, wooden box contained an array of canned and branded goods, which were received by the relief workers with anticipation and delight:

> We slit the gummed tape sealing the carton [and] our eyes popped as we lifted out a pound package of cube sugar, tins of cheddar cheese, of sardines, Nescafe, corned beef, tuna, Spam, dried milk, Crisco, a half pound chocolate bar, and seven packs of American cigarettes. 'That's to help out the DP food ration,' said the sergeant. 'There's about fourteen thousand calories in that box... I've got four boxcars of this stuff down on the tracks, fifteen thousand food parcels. Got orders to stick around with my guard until you've unloaded. Then it's your baby.'…

Hulme set about transferring the rations to a warehouse, but the task became difficult as crowds gathered around:

> It was as if the whole population had smelled that food right through the heavy cartons that packaged it, right through the tin that sealed in each wondrous unheard-of item. Before the first trucks had discharged their loads in the warehouse, the woods bordering the main road were alive with scurrying forms. Camp streets thronged with DPs chattering a language that did not even sound like Polish. Actually, it was the language of hysteria.[5]

[3] *The wild place*, 29.
[4] *The wild place*, 105.
[5] *The wild place*, 51-4.

The DPs assembled, demanding their ration packs with what, in Hulme's narrative, is an increasingly sinister chant, a frenzy of 'Spam-maddened adults': '*pakiety… pakiety… pakiety'*. Meanwhile, the relief workers retreated inside the warehouse. They were convinced that the DPs would waste the rations, consuming them all in 'a single night of magnificent celebration'. Hulme argued that 'one fatty pink slice of Spam would be enough to throw our camp into a maddened uproar'. In the interests of order, the relief workers broke up the wooden ration boxes, stacking the tins of different commodities into 'ancient step pyramids', 'looming in the warehouse gloom'. They made an inventory, planning to combine the commodities into communal meals. They devised a special kitchen to cook milk and chocolate for 'supplemental feeding'. In the end, the DPs did not receive the army rations directly. These revered commodities were taken out of their hands, converted by relief workers into ordered feeding programmes.[6]

Militarised aid

This was all about control. Hulme was expressing paternalism, claiming to act in the best interests of the DPs, and the DPs were expressing their agency, trying to govern what they ate. It was a struggle repeated in many other camps.[7] Marcus Smith, for example, received a large number of American parcels in Dachau, using the chocolate for hospital patients, canned beef for evening meals, and cigarettes as payment for labour.[8] Alex Bryan received a consignment of British army 'Pacific

[6] *The wild place*, 49-63.
[7] Hulme's narrative is supported by UNRRA documents, which show how surplus army rations and Red Cross parcels were released for the use of relief agencies. See, for example, the 1944 UNRRA *Monthly Reviews*, Office of Public Information, Washington Headquarters, United Nations Relief and Rehabilitation Administration. The struggle between relief workers and DPs can also be found in a number of other memoirs – see below, notes 8-10.
[8] Marcus Smith, *Dachau: the harrowing of hell* (Albany: State University of New York Press, 1995), 182-4.

Packs' in Solingen and started a child-feeding programme, with soup made from processed cheese.[9] Margaret McNeill converted parcels into communal meals, recounting the tensions this created.[10] In all these cases, the actions of relief workers were challenged By DPs. In McNeill's narrative, for example, the DPs could not understand why the relief workers spent all this time breaking up the ration packs into individual commodities and then cooking special meals, rather than just giving them out directly. The relief workers, for their part, bemoaned the DPs' 'incorrigible habit of taking all the tastiest ingredients out of the week's supply of food and making one delicious meal; after which followed a dreary period of nothing but watery pea soup'. In the battle for control, the relief workers wanted to plan everything and control the intake of food; the DPs wanted to use the ration packs as they wished. Even comparatively simple schemes caused dispute: when distributing chocolate to schoolchildren, the relief workers allocated it piece-by-piece, but the DPs said it should be given in whole bars, so the children could choose when to eat.[11]

In chapter two, I showed how control was central to contemporary humanitarian feeding. I argued that the CSB 'premix' was a way to guide nutrients into the body. By combining commodities like oil and sugar into a nutritionally balanced gruel, relief workers could restrict the mutability of food, controlling its use. This situation in South Sudan bears a striking similarity to post-war Europe. In the DP camps, the relief workers seized gummed packets of army rations, remaking them into communal meals. By mixing the surplus rations, the aid workers controlled what DPs ate. In both examples, the ability to trade or cook commodities was taken away, and the paternalistic intentions of the aid workers took precedence. The action of aid workers was justified on grounds of efficiency, making the most of limited resources,

[9] Alex Bryan, *Healing the wounds: Quaker relief work during World War Two and its aftermath* (London: Quaker Home Service, 1986), 12.
[10] McNeill, *By the rivers of Babylon*, 78-86.
[11] *By the rivers of Babylon*, 78-86.

but their opponents argued it was complicated and disempowering, taking time and removing choice when neither were plentiful. Chapter two raised the question: Why *not* give refugees in Yusuf Batil oil and sugar to make what they wished, especially during Ramadan? Why squelch them together into a sweet, oleaginous meal? The same could be asked of post-war relief. Why not allow people a night of magnificent celebration, followed by days of watery pea soup? Why not enable people to choose, especially after years of Nazi rule?

The paternalistic response to these questions – that it is for their own good – remains a recurring theme in humanitarianism. Michael Barnett made it central to his book, remarking of 'the rarity with which humanitarians ask the recipients what they want'; other scholars have made a career out of analysing how humanitarianism governs and controls people.[12] Much of this work draws inspiration from Foucauldian notions of biopower, suggesting that humanitarianism exerts a particular kind of control: one that is capillary in nature, dispersed throughout the social body, and centred on nurturing life. In this chapter I make a different suggestion. Feeding programmes, I argue, have long depended on a top-down, hierarchical kind of power. This can be seen in many distribution schemes, which are intricately managed, paternalistic, and governed by a militaristic order. In what follows, I suggest that the controlling, hierarchical element of relief has its roots in the interwar period, when humanitarian agencies were inspired by military procedures. Between the First World War and the end of the 1940s, I argue, humanitarianism and the military were intimately entwined: aid agencies borrowed from army handbooks, adopted army protocol, and mimicked procedures that were tightly organised, rigid, and preoccupied with efficiency.

[12] Barnett, *Empire of humanity*, 34-7. Barnett, it should be said, believes that paternalism can be constructive, but there is a more critical literature that views paternalism extremely negatively. See, for example, Duffield, *Development, security and unending war*; Hyndman, *Managing displacement*; Michel Agier, *Managing the undesirables: refugee camps and humanitarian government* (Cambridge: Polity, 2011).

This was particularly visible in the 1940s. As the last DPs were resettled, Jacques Vernant concluded that the great majority of them had been living in camps 'where a paternal administration drew up the menu, fixed meals and curfew times, chose the cinema films, allocated accommodation, washed linen and provided toothpaste, cigarettes and chocolate according to carefully worked out scales.'[13] This militaristic style of management was amply documented in the relief worker's memoirs. As we have seen, the DP camps were superimposed on army barracks.[14] The DPs became bureaucratic objects: after being registered and numbered, they were bunkered in dormitories and fed in communal kitchens.[15] Nutritional needs were calculated with calorific precision, and each new arrival was dusted with DDT powder in a process Primo Levi has described as a 'purification and exorcism'.[16] The relief was managed directly by soldiers until the UN took over, and, even then, the training procedure for new relief workers was highly militarised.[17] Even the Quakers – the most pacific of the aid organisations – sent their staff to Europe clad in grey uniforms, training them to cook on Aldershot ovens, and learning to manage refugees through exercises that, according to one recipient, closely resembled 'army manoeuvres'.[18]

In many ways, the intimate relationship between aid agencies and armies was unsurprising. After all, both had a similar logistical task. They both had to sustain

[13] Jacques Vernant, *The refugee in the post-war world* (London: G. Allen & Unwin, 1953), 162. See also Cohen, 'Between relief and politics: refugee humanitarianism in occupied Germany 1945-1946', 443.
[14] This was an explicit instruction from UNRRA, contained in their handbooks as well as guidance produced by the Supreme *Headquarters Allied Expeditionary Force*. A description of the criteria for selecting the location of DP camps can be found in the first chapter of Smith, *Dachau*.
[15] Jessica Reinisch, 'Introduction: Relief in the Aftermath of War', *Journal of Contemporary History* 43, no. 3 (2008): 377; Liisa Malkki, 'Refugees and exile: from "refugee studies" to the national order of things', *Annual Review of Anthropology* 24, no. 1 (1995): 498-9.
[16] Primo Levi, *The reawakening* (New York: Touchstone Books, 1993), 202.
[17] Mark Wyman, *DPs: Europe's displaced persons, 1945-1951* (London: Cornell University Press, 1998); Gerald Daniel Cohen, *In war's wake: Europe's displaced persons in the postwar order* (Oxford: Oxford University Press, 2012); Reinisch, 'Introduction: Relief in the Aftermath of War'.
[18] Francesca Wilson, 'Advice to relief workers, based on personal experience in the field' (London: Friends Relief Service, 1945), 25. The archives of the Friends Relief Service and Friends Ambulance Unit demonstrate these military characteristics, as discussed below.

large numbers of people, often on the move. They both had to deliver basic supplies to remote locations, relying on cheap, lightweight, and energy-dense food. They both had to set up camps and sanitation systems, managing potentially mutinous groups of people. Liisa Malkki noted how refugee management originated in the post-war period, when 'the technologies of power associated with the care and control of refugees' were found in many army procedures.[19] In this chapter, I look not just at refugees, but also at the wider world of humanitarian nutrition. I argue that the characteristics of contemporary nutritional relief were shaped by the army, and were well established in the post-war era. In fact, I look even further back: as a challenge to Malkki, I present the post-war arrangement as a culmination, rather than a starting point. Focusing on nutritional relief, I argue the relationship between humanitarianism and the military goes back to the 1920s, when three military values – order, efficiency, and mobility – found practical application in army procedures, and subsequently emerged as key features of relief.[20]

Order

The first of these characteristics was order. Humanitarianism between the wars came of age into a more methodical and systematic activity. It was no longer ad hoc and amateur, but became standardised and professional.[21] The Russian famine of 1921-22 was particularly significant, as it saw agencies develop what might be termed a large-scale 'soup kitchen' model of relief. This involved communal feeding in

[19] Malkki, 'Refugees and exile: from "refugee studies" to the national order of things', 498.
[20] The work considering the relationship between the military and relief in the Second World War includes Cohen, 'Between relief and politics: refugee humanitarianism in occupied Germany 1945-1946'; Johannes-Dieter Steinert, 'British humanitarian assistance: wartime planning and postwar realities', *Journal of Contemporary History* 43, no. 3 (2008); Reinisch, 'Internationalism in Relief: The Birth (and Death) of UNRRA'. Regarding a much earlier era, see Hutchinson, *Champions of charity*.
[21] Bruno Cabanes, *The Great War and the Origins of Humanitarianism, 1918-1924* (Cambridge: Cambridge University Press, 2014); Weindling, 'From sentiment to science'; Barnett, *Empire of humanity*, 82-94.

school halls, municipal buildings, or hospitals. The kitchens were run by local people, but were supervised and inspected by international staff. A soup or stew was doled out, made from whatever commodities could be located and transported to the disaster area. Children were referred from local schools, and issued with some kind of 'feeding ticket': a piece of card or improvised tally, which marked the meals they were given.

Soup kitchens were run by all the main agencies in the Russian famine, and their approach is nicely illustrated in a Save the Children report, covering the canteens in Aratov town during 1922.[22] Here, a midday meal was provided to children who had been recommended by a local committee. After being examined by a doctor, the children were given a feeding ticket, with the days of the month printed around its side. On arrival at the soup kitchen, the children presented their ticket, and the date was cut off. They were then given a meal based on the supplies available, usually soups made from 'rice, flour, milk, sugar and salt', 'beans, flour, lard and salt', or 'rice, milk, flour, cocoa, sugar'.[23] These were cooked into a soup by locals, their performance monitored by Save the Children. 'Control is maintained by inspection', the report declared, 'and the most effective weapon of control is to close a kitchen if it is badly run'.[24] A very similar method was developed in the ARA, whose hot meals were provided by local committees, acknowledged with a ration card, and monitored by a detailed inspection regime. The inspectors had strict instructions to ensure all food was eaten on site. Unsurprisingly, this was a hated regulation. According to Patenaude, who has written a massive book on the ARA, it was opposed because sick children could not leave home to attend the kitchens, and many others lacked the

[22] Sir Benjamin Robertson, 'Descriptive notes on tour in Saratov and Samara provinces', January 1922, Save the Children Fund (SCF) archives, collection EJ 198, box A0410, London, UK, 7. See also 'Report on SCFIU relief, 1921-23', 8th May 1924, in collection EJ 202, box A0410.
[23] These menus come from leaflets that were distributed to sponsors in the UK. "Details of Kitchens", undated, Save the Children Fund (SCF) archives, EJ200, box A0410. See also "Details of materials shipped to Russia, 1921-22", 1922, Save the Children Fund (SCF) archives, EJ202, box A0413.
[24] 'Descriptive notes on tour in Saratov and Samara provinces', 7.

proper clothes and shoes for the icy walk to canteens.[25] But Herbert Hoover, the director of the ARA, insisted on canteen feeding because he wanted to see the food go 'right down the children's throats'.[26]

The soup kitchen, therefore, involved a classic kind of paternalistic control – a way of ensuring that children received, and then ate, the food that was earmarked for them. It became the main relief template during the interwar period, and was still at work during the Spanish Civil War in the late-1930s. Francesca Wilson, for example, describes the network of canteens in Republican Spain, which, she said, was a remarkable feat of organisation and order. 'The relief workers had definite instructions given them', she writes. They first had to 'call on the mayor and ask him to find a locality and equipment for the meal'. They then had to 'select the most needy children'. Next, they had to 'go to the local Women's Service to recruit cooks and voluntary helpers.' Finally, the aid staff had to monitor several canteens: paying the cooks, taking care of the stores, checking inventories, and recruiting a 'responsible head' for the kitchen. The description of these tasks comes from a pamphlet entitled 'Advice to Relief Workers', which concerns the desirable qualities needed by an aid worker. It demonstrates the importance of managerial skills – particularly the ability to delegate, monitor, and order people and space – that were essential before humanitarianism became a more specialist pursuit.[27]

Wilson suggested that women were particularly well suited to these general, managerial tasks. They were more adaptable, she said, 'more ready for the thousand and one interruptions, make-do-and-mends and improvisations which emergency work involves'. They had a more varied selection of abilities, which enabled them to care for the 'helpless'. 'Every woman ought to know how to cook,' she declared, 'so

[25] Patenaude, *The big show in Bololand*, 86-9.
[26] Wilson, 'Advice to relief workers', 11.
[27] 'Advice to relief workers', 11. This is an almost identical procedure to that instructed to SCF representatives in 1920s Germany – see Eglantyne Jebb, 'Instructions for Mr. Theakston, the SCF delegate to Cologne', c. 1923, SCF archives, London, EJ 125, box A0404.

that she can judge if people are being properly fed'; but Wilson added this was obvious: a bit 'like saying that they ought to know how to darn their stockings'. She painted a picture of powerful, organised matriarchs, who had 'a sort of aura that made simple peasant people fear her a little, but trust and obey her too'. This kind of control was very important to relief work in Wilson's narrative, although she goes on to warn about the dangers of authority. Power, she argued, could go to the head. 'Women are more quickly intoxicated by power than men', she declared. 'I have seen some who have begun well, turn over-night into dictators. In a trice they are surrounded by sycophants. They appear in the press as Mothers of Starving Millions. Their tours become royal processions. No flattery is too gross for them.' Ordering people was a fine skill, it seems, requiring humility as well as strength.[28]

Soup kitchens were an obvious locale for such authority, but Wilson shows its importance for dry rations, too. Distributing items like grain and milk powder was not a favoured technique in this era, because it was difficult to monitor and supervise: in Hoover's terms, it was not amenable to watching the grub go down the gullet. Yet in the Spanish Civil War, dry rations were recognised as important, since the weakest and youngest could not travel to canteens. In order to maintain some control over the distributions, therefore, Wilson describes how mothers were required to bring back their empty milk tins before they could have more – the idea was that they could not sell the tins immediately and then return for some more. She also describes how the discarded tops of these tins were then given another life: used as metal discs, stamped with names and numbers, and strung around the children's necks (this was so the supervisors of soup kitchens could tell, at a glance, that only those entitled to the meal were present). The dried milk tins are mobilised by Wilson as an example of the 'make-do-and-mend' attitude, but they are also evidence of the monitoring that had

[28] 'Advice to relief workers', 9, 27.

become central to relief. These humble tin lids had become a dual source of control: a token that certified the correct use of milk, and a label for identifying eligible children.[29]

Such systems had a more militaristic hue once the Second World War was underway. As plans came together for the post-war aid work, organisations such as the Friends Relief Services – run by the Quakers – set up training courses for new recruits. The lecture notes, handbooks, and timetables from these courses can illustrate the nature of ordered relief.[30] In their course on food, for example, the trainees were taught the basics of nutritional science. They were instructed on nutrient categories, and practiced planning menus. They learnt the value of food in calories, and tried out recipes for mass feeding. They were taught to make ovens, building them from scratch. Photos from the archives show the young relief workers – pipes in mouths and hats on heads – constructing ovens at the Hampstead training centre. Towards the end of the course, they participated in role plays, where they confronted actors playing the DPs.[31] They received a lecture from Arthur Koestler, who prepared them for dealing with former concentration camp inmates: they 'feel like a dog on a chain', he warned, and 'it is no use expecting anything like a normal reaction to any remark or action'.[32] These were the training programmes that had been compared to 'army manoeuvres', leaving the aid workers solidly organised, deeply prepared.

The resemblance to army training was not a chance remark, because the courses were based on an army model. The ovens they built were army designs, including the 'Aldershot oven', which had been conceived at the army school of

[29] 'Advice to relief workers', 12.
[30] The Quakers were one of the biggest players in relief work from this era, and the material associated with their post-war training courses can be found at the Friends Relief Service archives, London, UK, boxes FRS/1992/28 and FRS/1992/30.
[31] Wilson, 'Advice to relief workers', 25.
[32] 'Notes for relief workers: the Phoenix Park Lectures', September 1943, Quaker archives, box FRS/1992/28. Section entitled: 'Notes on an Informal Talk given to the Friends' Emergency Relief Training Centre by Arthur Koestler'.

cookery, and the 'Triplex Oven no. 4', which dated back to the First World War.[33] The meals they cooked resembled army meals, and they closely supervised local workers to ensure that basic nutritional mistakes were not made, such as 'boiling cod liver oil in cocoa' or cooking cabbage for ten hours until all the vitamins were lost.[34] In the course handbook, trainees were directed to army pamphlets for further reading. This was not just in nutrition either: one can trace the resemblance with army methods in the courses on sanitation, first aid, and shelter.[35]

This ordered military character particularly affected camp management. Camps needed to be well ordered, the trainees were told, and 'any sentimentality would be most unwise'. Recruits were advised to maintain 'quite a large degree of externally applied discipline' – a point that was repeated later in the course in a more understated, and rather tortured phrase: 'the minimum possible amount of discipline is not necessarily the optimum amount'.[36] Francesca Wilson's own handbook echoed such advice. Relief workers, she said, should 'break the camp into small units', 'using loud speakers to explain plans, give information, call up labour, [and] prevent rumours'. Wilson also advised how to break up camps administratively, suggesting they be 'divided into self-governing sections of 1000 each, administered by an elected committee of ten'.[37] Paul Weindling has written of this era as one in which 'sentiment' gave way into 'science'; there had always been some kind of system in the distribution of relief, of course, but this era saw the start of a standardised and

[33] 'Nutrition and relief work: a handbook for the guidance of relief workers', (London: Council of British Societies for Relief Abroad (COBSRA), 1945), 90-8.
[34] 'Notes for relief workers: the Phoenix Park Lectures', September 1943. Sections entitled: 'Course I: Nutrition', 'Elementary Cooking', and 'European Peasant Diets'.
[35] In my M.Phil thesis I traced the similarity between these army documents and contemporary humanitarian handbooks, drawing on the personal archives of soldiers from the Royal Army Medical Corps, which are held at the Wellcome Library in London. Tom Scott-Smith, 'Food, water and modernity: a historical sociology of humanitarian relief', unpublished M.Phil thesis, Department of International Development, University of Oxford, UK, 2011.
[36] 'Notes for relief workers: the Phoenix Park Lectures', September 1943, Quaker archives box FRS/1992/28. See, in particular, the sections entitled: 'The Administration of Refugee Camps', 'Camp Psychology', and 'Some Administrative Problems in Temporary Communities'.
[37] Wilson, 'Advice to relief workers', 20.

ordered approach.[38] The work of early humanitarians was all about compassion and sentimentality, even if this only meant helping people to die with comfort. Relief workers in this era, however, were advised to eschew sentimentality and manage the masses in an ordered, scientific manner.

Efficiency (1): Calorie Counting

Science was also the source of the second characteristic of this era: the search for efficiency. The soup kitchen model of relief did not just cook up any old slop, but tended to justify the slop through a careful calculation of cost and calorie content. In the Spanish Civil War the canteen meals 'were planned scientifically', and based on 2000 calories per person per day.[39] In the Russian famine, the American Relief Administration devised rations that were 'scientifically prescribed', containing 'exactly the proper number of calories to maintain one child'.[40] In the 1920s, Save the Children calculated an average cost of 1½d per head for a meal of 600 calories, 'administrative expenses included'.[41] In these quantifications, food was reduced to a figure. It is an example of nutritional reductionism, where, for the purposes of management, meals were reduced to their biochemical parts or their energy value.[42]

[38] Weindling, 'From sentiment to science'. See also Ben Shephard, 'Becoming planning minded: the theory and practice of relief 1940-1945', *Journal of Contemporary History* 43, no. 3 (2008).
[39] Wilson, 'Advice to relief workers', 10.
[40] Patenaude, *The big show in Bololand*, 89; Paul Weindling, 'The role of international organizations in setting nutritional standards in the 1920s and 1930s', in *The science and culture of nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, (Amsterdam: Rodopi, 1995), 320.
[41] Save the Children Fund, 'Resolution of Vienna', from the Fourth International conference on Work with Children, 8th October 1924. SCF archives, collection EJ258, box A0415. See also Save the Children Fund, 'Reports of meetings held at Hotel Rome, Riga', 30th March 1922, SCF archives, collection EJ255, box A0413.
[42] There is not a great deal of evidence that these stipulations were followed closely by relief workers, although most memoirs mention the target of 2000 calories per day, so they were certainly aware of them. It is likely that a great deal of guessing and improvisation went on in practice, but in future decades (particularly in the high modernist era), the calculation of rations became a much more important part of relief. See chapter five.

One of the best articulations of the reductionist view can be found in the *Handbook for the Guidance of Relief Workers,* produced in 1945 by the Council of British Societies for Relief Abroad (COBSRA). Referring to feeding schemes, this document read: 'enough to eat, in the final analysis, does not mean enough bread, or enough soup, or enough potato; it means enough of each of the *nutrients* of which food is composed.'[43] Seeing food as nutrients was a fundamental intellectual change, which had begun in the 19th Century. It allowed for new measures of food to emerge, such as the calorie, which turned food into units of energy.[44] This was by no means an obvious way of seeing food; in fact, its novelty can be illustrated by comparing popular cartoons with the COBSRA handbook. For many people, enough to eat meant *precisely* enough bread, enough soup, or enough potato. To think of it terms of nutrients, or calories, was alien. Cartoons from the 1940s portray calories as byzantine, ephemeral, even fantastical. One cartoon from Die Zeit represented them as bubbles, floating up from the hungry masses trying to catch them on their plates.[45] Another, in a Berlin women's magazine, showed a child asking his mother 'do we always have to eat calories? Couldn't we occasionally eat a nice piece of cake?'[46]

Yet the calorie had value for relief workers: it made food quantifiable, comparable, and offered a 'universal language of standard units'.[47] Nick Cullather, in a particularly insightful article, argued that the calorie had governmental functions, making food 'politically legible' for administrators.[48] According to Cullather, 'the

[43] 'Nutrition and relief work: a handbook for the guidance of relief workers', 19.
[44] The calorie as a unit of measurement emerged at the end of the 19th Century and was associated with industrial planning. For an overview see Nick Cullather, 'The foreign policy of the calorie', *The American Historical Review* 112, no. 2 (2007); Kenneth Carpenter, *Protein and energy* (Cambridge: Cambridge University Press, 1994).
[45] 'The Illusion of the German Calories', *The Manchester Guardian*, 13th December 1946.
[46] Paul Steege, *Black market, Cold War: everyday life in Berlin, 1946-1949* (Cambridge: Cambridge University Press, 2007), 48.
[47] Frank Trentmann, 'Coping with shortage: the problem of food security and global visions of coordination, c.1890s-1950', in *Food and conflict in Europe in the age of the two world wars*, ed. Frank Trentmann and Flemming Just, (New York: Palgrave Macmillan, 2006), 30.
[48] Cullather, 'The foreign policy of the calorie'. See also Grossmann, 'Grams, Calories, and Food'; Alice Weinreb, '"For the hungry have no past, nor do they belong to a political party": debates over German

work of rendering food into hard figures began just after breakfast on Monday, March 23, 1896, when Wilbur O. Atwater sealed a graduate student into an airtight chamber in the basement of Judd Hall on the Wesleyan University campus.' This late-Victorian moment marked the first of Atwater's experiments with the calorimeter: a vast machine in which the intake and expenditure of human energy was measured. The subject was closed inside the chamber and asked to do different kinds of work: clerical tasks, weight lifting, riding a stationary bicycle, or just sitting at rest. Meals were passed through an airlock in the chamber, and the nutritional content of the food was carefully measured. The calorimeter sought to establish what inputs were required to do a range of different tasks. Atwater was just one of many biochemists conducting dietary observations in the late nineteenth century, and his work can be read alongside Carl Von Voit, Max Rubner, and Armand Gautier among others, who produced a vast amount of data, judging the consumption needs of everyone from the French bourgeois to the English blacksmith, and later looking at the needs of distant 'native peoples'.[49]

Much of this research was framed as a tool of scientific management, or Taylorism. Named after Frederick Winslow Taylor, this industrial movement became influential around the turn of the century. Taylor was a mechanical engineer who was obsessed with productive efficiency, conducting 'time and motion' studies on manual workers, breaking their tasks down into the smallest possible components, and measuring how quickly they could be completed. The idea was to standardise production, monitoring the inputs and outputs of every factory procedure. With its preoccupation with efficiency, this was a natural place to apply the new dietary

hunger after World War II', *Central European History* 45, no. 01 (2012); James Vernon, *Hunger: a modern history* (London: Belknap, 2007).

[49] Cullather, 'The foreign policy of the calorie', 343-5; Anson Rabinbach, *The human motor: energy, fatigue, and the origins of modernity* (New York: Basic Books, 1990), 131; Kenneth Carpenter, 'Protein', in *The Cambridge world history of food*, ed. Kenneth F. Kiple and Kriemhild Coneè Ornelas, (Cambridge: Cambridge University Press, 2000); Harmke Kamminga and Andrew Cunningham, eds., *The science and culture of nutrition, 1840-1940*, (Amsterdam: Rodopi, 1995).

research: knowledge of nutritional requirements helped factory managers break down the costs of production ever more precisely, enabling them to calculate the cost of labour power in terms of calorific intake. Wage rates could then be justified rationally, offering workers enough money for sustenance, whilst keeping them at a level that was deemed scientific – and, at the same time, maximising profits.[50]

Taylorism represented a significant change in our understanding of the human body. It conceived people as machines, consuming a calorific input and producing a physical output. As Anton Rabinbach has argued, this 'metaphor of the human motor' dominated the nineteenth century, influencing science and social thought of all types.[51] It did not just appear in Taylorism, but in Marxism as well – indeed, minimum dietary requirements were used by the labour movement to campaign for higher wages, leading to an ideological tug of war within nutritional science, which has been particularly well analysed in the work of Aronsen.[52] Calories could be mobilised for resistance, but in all ideological manifestations, they led to a dominant view of food. The idea of the 'human motor' reduced food to fuel. What we ate became an energy input, to drive the human machine. Food had previously been (and for many people, still was) valued for different reasons – as a marker of social distinction, as a source of familial harmony, as an aesthetic joy to be celebrated – but the human motor redefined food as a quantitative input of energy.

Arguably, this occurred well before Wilbur Atwater sealed that graduate student into the airtight confines of a calorimeter: it began with the first biochemical discoveries, which divided foods into carbohydrates, fats and proteins. Liebig's 1842 book *Animal Chemistry* marked the birth of nutritional science; his approach was to

[50] Milles Dietrich Milles, 'Working capacity and calorie consumption: the history of rational physical economy', in *The science and culture of nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, (Amsterdam: Rodopi, 1995).
[51] Rabinbach, *The human motor*. See also Vernon, *Hunger*, 159-95.
[52] Naomi Aronson, 'Nutrition as a Social Problem: A Case Study of Entrepreneurial Strategy in Science', *Social Problems* 29, no. 5 (1982); Naomi Aronson, 'Social definitions of entitlement: food needs 1885-1920', *Media, Culture & Society* 4, no. 1 (1982).

measure and analyse what was ingested and excreted by the body, and determine the chemicals being used.[53] From this moment, individual foodstuffs lost their unity in the minds of many nutritionists. Foods became amalgamations: bundles of constituent nutrients, which played specific roles in the body. Food was now ingested for more physiological reasons: first for health, and later for efficiency.[54] As these ideas infiltrated institutional life, they became visible in handbooks and guidelines. Pamphlets concerning army feeding in Britain, for example, changed dramatically from the middle of the nineteenth century to the First World War. In 1861, they offered an aesthetic and naturalistic account of food: rich in descriptions of flavour, speckled with herbs and spices, and featuring long accounts regarding how crops were grown and harvested.[55] By the First World War, however, the army handbooks were more direct, more imperative. They contained the basics of nutritional science, and much advice for making victualing efficient and economical.[56]

By the time humanitarianism had become a stable, institutionalised regime between the wars, the idea of 'food as fuel' was commonplace. It had been popularised in the army, and it seeped into policy debates – such as the crisis over 'national deterioration' and the efficiency of the working class diet.[57] Humanitarian agencies, therefore, absorbed these same preoccupations, often with their same

[53] Justus Liebig, *Animal chemistry: or, chemistry in its applications to physiology and pathology* (London: Taylor and Walton, 1843).
[54] Mark Finlay, 'Early marketing of the theory of nutrition: the science and culture of Liebig's extract of meat', in *The science and culture of nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, (Amsterdam: Rodopi, 1995); Harmke Kamminga and Andrew Cunningham, 'Introduction: the science and culture of nutrition, 1840-1940', in *The science and culture of nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, (Amsterdam: Rodopi, 1995).
[55] George Warriner, 'Instructions to military cooks in the preparation of dinners at the instruction kitchen, Aldershot', 1861, British Army School of Cookery, Bodleian Library, University of Oxford, UK
[56] 'Manual of military cooking (and dieting)', editions from 1895 to 1915, War Office pamphlet, University of Oxford, UK. See also Mikulas Teich, 'Science and food during the Great War: Britain and Germany', in *The science and culture of nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, (Amsterdam: Rodopi, 1995).
[57] Vernon, *Hunger*, 87-94.

militaristic overtones.[58] They became obsessed with efficiency. They measured food in terms of energy, they calculated the calorific value of meals, and they used the same quantitative indicators as found in the studies of the human motor. During the First World War, for example, the Red Cross conducted time and motion studies in their hospitals, seeking Taylorist efficiency.[59] In the 1920s, Hoover's American Relief Administration assigned rations according to occupation, with miners, coachmen, and servants receiving different quantities of food.[60] In the 1940s, we can see calorific requirements broken down for 'heavy' and 'light' and 'moderate' workers in a number of relief agency handbooks.[61] The COBSRA handbook, issued in 1945 for all British relief agencies, was particularly blunt in its adoption of efficient principles. 'The human body is a working machine', it read; 'you can no more get work out of the human machine if you have not provided the necessary food than you can run an engine without petrol and fuel oil'.[62]

Efficiency (2): Deconstructing the diet

This perspective was not accepted without question, and perhaps the biggest challenge to the human motor came with the discovery of vitamins. Prior to vitamins, judging food was a purely quantitative affair. It was all about energy. If the body was receiving enough energy, then its nutritional needs were being met. But for many biochemists, this was too simplistic: there were additional, 'accessory factors' in the

[58] Mark Harrison, 'Medicine and the management of modern warfare', *History of Science* 34(1996): 389-99.
[59] Roger Cooter, 'Medicine and the Goodness of War', *Canadian Bulletin of Medical History* 7(1990): 155.
[60] Cullather, 'The foreign policy of the calorie', 351.
[61] 'Notes for relief workers: the Phoenix Park Lectures', September 1943, Quaker archives, box FRS/1992/28. Section entitled: 'Course I: Nutrition'. International Refugee Organisation, 'Operational Manual', 1950, Form A.100.02, Weiss papers, PW/PR/IRO/2, Bodleian Library, Oxford, UK. Rose Simmonds, 'Manual of Nutrition', British Red Cross archives, file 1099/20/91/412/R251, London, UK, page 4.
[62] 'Nutrition and relief work: a handbook for the guidance of relief workers', 14.

diet, essential chemicals that the body required. These had nothing to do with energy, nothing to do with driving the human machine; they existed to prevent 'deficiency diseases', such as scurvy, pellagra, rickets, and beriberi. Casimir Funk coined the collective name for these essential chemicals – vitamins –in 1911. Believing them to be amines, Funk proclaimed them 'vital amines', and then contracted the term to 'vitamines'. It was later discovered they were not amines at all, so the final 'e' was dropped and the terminology remained, but Funk's work – alongside that of other biochemists like Frederick Hopkins and Christiaan Eijkman – became popularised as the 'newer knowledge of nutrition'. This was the title of a 1918 book, which concerned 'the use of food for the preservation of vitality and health'.[63]

The 'newer knowledge of nutrition' could be neatly contrasted with the old. It seemed to offer a direct challenge to the earlier paradigm, an alternative to the 'human motor'. It implied that nutrition was a matter of quality, not just quantity. It suggested that fresh fruit was needed, not just carbohydrates. It advised that the nature of foods was important, not just their energy content. But although vitamins seemed to challenge the previous approach, it ended up subsumed within it. Vitamins became absorbed within the existing view of food. The body's need for 'accessory factors' became reduced to hard figures, and the discovery of vitamins was incorporated into the quantitative paradigm. Vitamins were reduced to a chemical quantity, measured in milligrams, and synthetically produced as a tablet.

We can see this particularly clearly in emergency nutrition. If we trace the Red Cross handbooks between the wars, for example, we can see how vitamins were simply added to the list of bodily requirements. Every few years a new vitamin was

[63] Mark Weatherall, 'Bread and newspapers: the making of 'a revolution in the science of food'', in *The science and culture of nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, (Amsterdam: Rodopi, 1995); Harmke Kamminga, ''Axes to grind': popularising the science of vitamins, 1920s and 1930s', in *Food, science, policy and regulation in the twentieth century: international and comparative perspectives*, ed. David Smith and Jim Phillips, (London: Routledge, 2000); Aronson, 'Social definitions of entitlement'.

discovered, but this did not change the fundamental way food was being conceived: it just led to an expansion in the list of nutrients to take into account. Meals were now judged not just on the basis of their energy value, but also on their vitamin content, and in both cases food became a list of numbers. What first appeared revolutionary – a reminder that the input/output model of the human machine was simplistic, a challenge to the purely quantitative view of food, a vivid illustration of the sheer complexity of the diet – became another component of the dominant nutritional paradigm. In the end, vitamins vindicated the mainstream approach: they seemed to demonstrate that science had discovered human needs in all their intricacy, and could meet these needs with the maximum of efficiency.

In practical terms, this meant food supplements. When vitamins could be manufactured synthetically, the 'newer knowledge of nutrition' became a technocratic intervention – a miracle pill. Their discovery led to new medicines, tablets, and additives. They generated a massive marketing opportunity and a set of new humanitarian techniques.[64] Vitamin pills became a staple of relief supplies, a manufactured alternative to a balanced diet. Such was their dominance that they came to be mocked: an Indian cartoon during the Bengal famine, for example, satirised the relief agencies use of vitamins by showing emaciated figures transform into corpulent masses upon ingesting the tiny pill.[65] Other products entered the humanitarian toolkit. Cod liver oil, which had been an ancient remedy for the infirm, was given a new lease of life, now endorsed as a source of vitamin D. Marmite – the salty yeast extract usually spread on toast – was found to be rich with vitamins, so was combined with milk in the 1930s to become a starvation diet in the Gold Coast. Bemax – a

[64] Sally Horrocks, 'The business of vitamins: nutrition science and the food industry in inter-war Britain', in *The science and culture of nutrition, 1840-1940*, ed. Harmke Kamminga and Andrew Cunningham, (Amsterdam: Rodopi, 1995); Rima Apple, 'Vitamins and the war: nutrition, commerce, and patriotism in the United States during the Second World War', in *Food, science, policy and regulation in the twentieth century: international and comparative perspectives*, ed. David Smith and Jim Phillips, (London: Routledge, 2000).
[65] 'The miracle of vitamins', *Hindustan Times*, 7th November 1943. See also Vernon, *Hunger*, 150.

wheatgerm-based 'vitamin tonic food' – was also tried.[66] Companies found vitamins very useful in pushing their products, and relief workers took them overseas. By the 1940s, Keynes was ridiculing this kind of nutritional obsession, sarcastically suggesting that vitamins must be the first priority for a devastated, starving, post-war Europe.[67]

For many humanitarians, however, vitamins *were* a high priority. If essential nutrients could be isolated and manufactured, they could find out how to 're-feed' the starving. The dangers of nursing the severely malnourished had been long acknowledged in the medical literature: it was widely known that eating too much, or too suddenly, could cause serious digestive trouble and often death. As a result, the worst cases of starvation were usually given a liquid diet, eaten very regularly, in small quantities. The soups of flour, rice, and sugar during the Russian famine were based on this principle; so were the milk-and-marmite mixtures used in the Gold Coast. These treatments built on a Victorian culture of feeding the sick with high protein soups and gruels. Beef tea, for example, was a very common food for convalescents in the second half of the 19th Century; it was recommended by Florence Nightingale and vigorously marketed by Justus Liebig.[68] Dietary handbooks recommended a mix of milk, sugar and water 'to be administered until the digestive strength returns', or egg white and water, strained through a muslin.[69] In the Bengal famine of 1943, these approaches were still being used, and the British army

[66] Jennifer Stanton, 'Listening to the Ga: Cicely Williams' Discovery of Kwashiorkor on the Gold Coast', in *Women and modern medicine*, ed. Lawrence Conrad and Anne Hardy, (Amsterdam: Rodopi, 2001), 160. Tinned milk was advocated a lot by colonial doctors, and the idea of combining Marmite and milk probably originated in the Birthday Trust Fund. A. Susan Williams, 'Relief and research: the nutrition work of the National Birthday Trust Fund, 1935-9', in *Nutrition in Britain: science, scientists and politics in the twentieth century*, ed. David Smith, (London: Routledge, 1997), 104.
[67] Elizabeth Borgwardt, *A new deal for the world: America's vision for human rights* (Cambridge: Belknap Press, 2005), 116.
[68] Florence Nightingale, *Notes on nursing: what it is, and what it is not* (London: Harrison, 1859), 36-42; Finlay, 'Early marketing of the theory of nutrition'.
[69] W. Gilman Thompson, *Practical dietetics: with special reference to diet in disease* (London: Henry Kimpton, 1902), 303; Chalmers Watson, *Food and feeding in health and disease: a manual of practical dietetics* (London: Oliver and Boyd, 1910), 564-5. The egg white mix, it was claimed, 'contains as much protein as commercial beef juice'.

developed the 'Bengal famine gruel': a 'mixture of powdered milk dissolved in boiling water, laced with enormous quantities of white sugar and flour'. This concoction 'resembled a thick, white soup, its taste, excessively sweet'.[70]

From the perspective of nutritionists, these mixes were rather crude. The discovery of vitamins and the manufacture of food supplements offered a chance to be more precise, so nutritionists identified the nutrients and developed them into treatments. Some injected the starving with nicotinic acid, believing their oedema to be a niacin deficiency. Others experimented with Vitamin B12 and Ventriculin – a proprietary extract of desiccated hog's stomach, which was thought to help the intestine absorb the vitamin.[71] Desiccated stomach was a particularly unpleasant substance: it had a foul smell, which could be disguised by stirring it into a glass of very cold water, but the powder did not dissolve, coating the glass and tongue with coagulated duodenum.[72] Casilan was more pleasant: a protein powder made from casein – the protein found in milk – which could be sprinkled onto food, or used in formulae for the starving, but it was used slightly later.[73]

Just like breaking down the components of a production line through time and motion studies, or breaking down the nutritional needs of the human with calorific precision, these experiments with therapeutic food disassembled things into their component parts. Physicians knew milk worked, so they disassembled this into Casilan. They knew vitamins were important, so they injected them directly. They knew absorption was important, so they administered pig's stomach, otherwise known

[70] Ben Shephard, *After daybreak: the liberation of Belsen, 1945* (London: Pimlico, 2006), 99; Elly Trepman, 'Rescue of the Remnants: The British Emergency Medical Relief Operation in Belsen Camp, 1945', *Journal of the Royal Army Medical Corps* 147(2001): 287. The quotation is from a letter by the director of the Red Cross operation in Belsen, many years later: Anthony Aspinall, 'Letter: The Strange Case of Bengal Famine Gruel', *The Independent*, 30th January 1993.
[71] Carpenter, *Protein and energy*, 148.
[72] 'Desiccated Stomach Substance', *British Medical Journal* 1, no. 4554 (1948).
[73] R.F.A Dean, 'Treatment and prevention of kwashiorkor', *Bulletin of the World Health Organization* 9, no. 6 (1953); E. R Huehns, 'Kwashiorkor', *British Medical Journal* 1, no. 4821 (1953).

as '*desiccated*, defatted *duodenal* powder'.[74] This, in effect, was the deconstruction of diet. It was just as concerned with efficiency, but it achieved this not by generalising – consolidating the diet into a single, numerical measure – but by disaggregating it, fragmenting it, breaking it down into ever-more precise components. The different parts of the diet were isolated, and then administered in another form: a form that only *resembled* food, and was often completely unpalatable.

The deconstruction of diet reached a high point in the Second World War. After the liberation of Germany in 1945, army medical teams were faced with thousands of dying, seriously malnourished individuals in concentration camps. This enabled them to put into practice many of the new techniques, and the most famous example was the British response to Bergen-Belsen, which has entered into the mythology of humanitarianism as the place where therapeutic feeding was invented.[75] A close look at the archives, however, shows that relief in Belsen was peppered with failure. There is a great deal of literature available, and the archives of the Royal Army Medical Corps describe the treatments in detail. Indeed, the story is so captivating because it was experimental, because it was tragic, and it began with calamity piled on calamity: the initial response of British soldiers at Belsen, who did not know about re-feeding syndrome, was to offer their army rations. These contained an assortment of rich, dense, fatty, processed foods. The result was catastrophic.

[74] P. J. Raimondi and F. R. Goetzl, 'Treatment of idiopathic ulcerative colitis with desiccated, defatted duodenal powder', *Permanente Foundation Medical Bulletin* 7, no. 1 (1949).

[75] This myth cropped up in a number of interviews with retired humanitarian practitioners, which were conducted as starting points for this research. The real history of therapeutic feeding, however, is far more complex: as we have seen, it goes back to the Victorian age, probably even further back, and the experiments in Belsen were largely a failure. For overviews, see J. Vaughan, C. Dent, and R. P Rivers, 'Discussion: The Physiology and Treatment of Starvation', *Proceedings of the Royal Society of Medicine* 38, no. 7 (1945); Glyn Hughes, 'Medical students and Belsen concentration camp', *The Lancet* 245, no. 6355 (1945); Alex Paton, 'Mission to Belsen 1945', *British Medical Journal* 283, no. 6307 (1981); Ben Shephard, 'The medical relief effort at Belsen', in *Belsen 1945: new historical perspectives*, ed. Suzanne Bardgett and David Cesarani, (Edgware: Vallentine Mitchell, 2006).

According to some reports, up to 2,000 people died from re-feeding, 'many dropping dead at the first mouthful'.[76]

Within a few weeks, however, the Royal Army Medical Corps (RAMC) had established medical wards for the starving. They were joined by the British Red Cross and the Medical Research Council, who offered a display of the latest famine treatments, a selection of deconstructed diets.[77] One procedure centred on the blood. Described in the archives as the 'intravenous therapy', it entailed administering plasma and glucose directly into the veins. The treatment was based on the idea that the protein levels in the blood were too low, and it was best to restore these proteins directly (plasma is a protein reserve). According to one newspaper report, the entire plasma stock of the London Air Raid precaution services was offered for this experiment: dried plasma was widely distributed in the Second World War to be reconstituted for transfusion at the front lines, and also available to the RAMC doctors.[78] The two powders – plasma and glucose – were then given according to a strict schedule: 'one bottle double strength plasma twice on the first day, then single strength plasma twice on the next two days. Glucose and vitamins must be given at the same time [with] 75g of glucose for each ½ litre of serum and three compound vitamin tablets'.[79]

Even greater excitement surrounded protein hydrolysates. These were partially digested proteins based on 'casein from milk and extracts of lean beef', and, again,

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[76] Trepman, 'Rescue of the Remnants', 286; F. M. Lipscomb, 'Medical aspects of Belsen concentration camp', *The Lancet* 246, no. 6367 (1945); J. B Walker, 'The feeding problem', *London Hospital Gazette* 48(1945).

[77] Many of the treatments are contained in the archives of the Royal Army Medical Corps, Muniments Collection, Wellcome Library, London, UK, particularly in the Lipscomb papers, RAMC/792/3. Further details can be found in the contemporary medical literature, for example Vaughan, Dent, and Rivers, 'The Physiology and Treatment of Starvation'; Lipscomb, 'Medical aspects of Belsen concentration camp'.

[78] David Anderson, 'Nutrition Experts Arrive in Holland: Eight-man team, with plasma and diet for starving populace, awaits only liberation', *New York Times*, 10th April 1945. For background to dried plasma, see F. R. Edwards, J. Kay, and T. B. Davie, 'Preparation and Use of Dried Plasma for Transfusion', *BMJ* 1, no. 4131 (1940).

[79] F. M Lipscomb, 'Belsen camp: use of proteolysates, plasma and serum in starvation', 18th May 1945, RAMC archives, Wellcome Library, London, UK, box 792/3/4.

were administered on the grounds that they would restore essential amino acids.[80] They had been devised as a treatment for starvation during the Bengal famine, and were introduced on a large scale in Bergen-Belsen.[81] The MRC brought many litres from London, which was given to the starving to drink. It was 'foul', wrote one medical volunteer; it 'smelt like vomit', and even mixing it with Oxo, Bovril and cocoa failed to disguise the flavour.[82] Relief workers resorted to nasal tubes or intravenous injections to get the hydrolysates into the wasted bodies, but the former inmates reacted dramatically to such invasive procedures. Reminded of Nazi tests and executions, they screamed and struggled, shouting '*nicht crematorium'* as the medical workers approached them.[83] The Medical Research Council's persistence surprised even the doctors: 'they are doing yet another trial of protein-hydrolysate,' wrote one; 'another round of tortures'. 'I watched the horror and loathing of the patients who had to drink two cup-fulls of the stuff', he continued, calling for it to end as soon as possible.[84]

The procedure did come to an end eventually. After about a month, the leader of the MRC team admitted that the protein hydrolysates had failed.[85] Hundreds of litres of hydrolysates were destroyed, and relief workers returned to older, far more successful treatments, which involved giving frequent, small amounts of easily digestible food by mouth.[86] They used Belsen to find the most effective famine formula, or 'F-treatment', as it had become known. The mixture used in the Bengal

[80] Anderson, 'Nutrition Experts Arrive in Holland: Eight-man team, with plasma and diet for starving populace, awaits only liberation'.
[81] E. K. Narayanan, K. V. Krishnan, and G. Sankaran, 'Protein hydrolysates in the treatment of inanition', *Indian Medical Gazette* 79(1944).
[82] R. F. Cordell and D. H. Forsdick, 'Symposium: Commemoration of the Liberation of the Bergen-Belsen Concentration Camp and Medical Management of Disasters', *Journal of the Royal Army Medical Corps* 145(1999): 29; Shephard, *After daybreak*, 100.
[83] *After daybreak*, 100; W. R. F. Collis, 'Belsen Camp: A Preliminary Report', *The British Medical Journal* 1, no. 4405 (1945); Paton, 'Mission to Belsen 1945'.
[84] The doctor was Alex Paton. Shephard, *After daybreak*, 101 and note 21.
[85] Janet Vaughan, 'Treatment of Starvation: a Report to the War Office and the Medical Research Council', 24th May 1945, Muniments Collection, RAMC 792/3/4, Wellcome Library, London, UK. See also note 20 in *After Daybreak*. Critics have said that failure was evident from the start.
[86] Vaughan, 'Treatment of Starvation'.

famine, for example, was brought to Belsen and administered by the Red Cross, but despite high hopes, the 'Bengal famine gruel' was considered far too sweet and widely disliked.[87] Some Red Cross workers tried to adapt it, but others declared that the inmates could not possibly be hungry if they were refusing food: 'they are too bloody particular', said one.[88] In the memorable words of another Red Cross worker, 'the pathetic, skeletal inmates who had sufficient strength to talk' shared their 'intense loathing' of the food: they wanted something with vinegar, something savoury, he said:

> We tried for several days to persuade them of the nutritional value of the gruel and, at nightfall, would leave a full churn in every hut in the hope that they would help themselves. This only resulted in the most active among them lugging the churn out into the darkness and tipping the contents over the ground. At first light when we re-entered the camp, each hut would be partly encircled by a lake of gleaming, white gruel. The occupants of the huts complained bitterly that the smell made them feel more unwell than the stench of death and excrement in which they had for so long existed.[89]

This was surely a low point for the Red Cross workers: their confidence sinking into a pool of thick white soup, surrounded by the camp mud. At the very least, they learnt that taste was important, and this led to a more successful approach: a mixture of milk, with the addition of glucose and vitamins. This resembled real food. It looked and tasted like milk; indeed, it *was* milk, sweetened and served with the equivalent of a vitamin pill. It was much more acceptable than the hydrolysates or the Bengal famine mixture because it was familiar. Yet even as it became the recommended approach to starvation, it did not represent a significant change in the

[87] Shephard, *After daybreak*, 98-100.
[88] *After daybreak*, 99; 'The medical relief effort at Belsen', 42.
[89] Aspinall, 'Letter: The Strange Case of Bengal Famine Gruel'.

relief workers' approach to food. The relief workers still approached food as fuel, as a medicine. In the MRC notes, it was articulated as:

> A solution of… spray-dried skimmed milk powder 60g, glucose 40g, [and] water 500c.c combined with vitamin mixture (Protein 21.5g, Fat 4g, Carbohydrate 60g, Calories 396). This mixture should then be diluted half and half at each feed with either water, tea, coffee, or any other flavouring that is available…. The need for protein must be remembered, and after 3-4 days dried egg, if available, may be added to the milk mixture.[90]

Thus, one of the lessons from Belsen was missed: that food is not just a cure, and that recipes are not just medical prescriptions. The Belsen inmates had rejected the revolting hydrolysates and saccharine-sodden famine mixtures, and in doing so they had indicated that form mattered, that delivery mattered, but also that approach mattered. By expressing their preference for sour and savoury food, even when they were close to death, they had illustrated the multiple values of food, which is not just a curative, nor just a source of energy, but a social and cultural phenomenon, which retains importance even when people are dying. Food, in the hands of the post-war aid workers, had been redefined: extracted from its social and political context and reduced to a formulae, a set of nutrients.

Mobility

Francesca Wilson beautifully illustrated the misplaced confidence that accompanied vitamin-inspired relief. When comparing humanitarian aid in the Second World War with that of the First, a fellow relief worker exclaimed to her: 'What child's play it will be this time! We were groping in the dark then. Now we

[90] Janet Vaughan, 'Treatment of Starvation: a Report to the War Office and the Medical Research Council', 24th May 1945, Muniments Collection, RAMC 792/3/4.

know what vitamins are needed for every type of malnutrition. A bomber load of vitamins will be enough to cure a whole population.'[91] This quotation contains a variety of motifs: militaristic language, a sense of enlightenment, and this supreme confidence that relief workers could control the messy realities of post-war Europe. Yet the main motif is mobility. The awe of the relief worker emerged from logistical power: the formidable aeroplanes dropping tiny tablets that could cure a population. This was a dream that was fast becoming reality with new technologies of dehydrating foods. As Francesca Wilson wrote excitedly, 'a good meal for a hungry man of meat, potatoes, carrots and greens, treated so they retain their vitamins and protective properties, is now the size of a crown piece'.[92]

Mobility was the third feature of the militaristic era. Along with order and efficiency, it became central to relief. Arguably, it had always been important – without mobility, international humanitarianism would not have existed in the first place – but it became especially crucial after World War One, when humanitarians developed international ambitions, expanding from Europe to new areas of the world.[93] This new, international reach required techniques of feeding that could be transplanted to remote locations. It meant foods that were portable, lightweight and long lasting. To adapt a phrase from Latour, it required *edible immutable mobiles*. Humanitarians needed foods that could be transported from place to place without changing, degrading, or rotting.

How do you make food mobile? The traditional techniques are to preserve it, dry it, or seal it in tins. These were the techniques behind military rations. For hundreds of years armies have found ways of feeding people on the move, sailors have done so for even longer; the distant ancestor of most portable rations is hardtack,

[91] Wilson, 'Advice to relief workers', 13.
[92] 'Advice to relief workers', 13.
[93] A good example of this new international reach is the expansion of the ICRC's work to Ethiopia in the 1930s. See Forsythe, *The humanitarians*, 13-50.

or the ship's biscuit, a cracker made from flour, salt and water, baked and left to harden and dry. Hardtack has been around for as long as seafaring, but it became a permanent, standardised element of navy life in the 17th Century.[94] It was later adopted by the army, combined with the new canning technologies to become the classic military ration – 'bully beef and biscuits' – which featured in many soldier's reminiscences. The biscuit became a prototype for humanitarian rations, modernised and enriched, and the convenience of feeding people on army rations was born. After the First World War, bully beef and biscuits were part of the 'Nansen' rations for refugees in Eastern Europe.[95] After the Second World War, surplus army rations were distributed to the displaced. Even now, certain relief foods are based on military rations, and manufactured by the same companies. Making foods portable was refined in the military, and then crossed over to relief.

The other way to make food mobile is to strip it back into its component parts. Getting grain, meat and vegetables to a disaster zone is a complex task, with a great many logistical elements. Getting a bomber load of vitamins, however, is easier. Cooking someone a meal is terribly complicated, especially when accounting for different cultural predilections. Providing them with glucose and a cupful of protein hydrolysates, however, is simpler. If we think of food as nutrients, we can meet people's needs more efficiently; we can offer them protein and carbohydrates in a stable, standardised form. We can move these nutrients from place to place without the difficult business of purchasing, storing and cooking foods. This is especially true if such medicinal products are manufactured synthetically in chemical laboratories, but it is also true if we are sourcing the nutrients closer to the disaster zone. By

[94] In Britain, for example, victualing became centralised under the direction of Samuel Pepys. J. R. Tanner, *Samuel Pepys and the royal navy* (Cambridge: Cambridge University Press, 1920).
[95] Save the Children Fund, 'Reports of meetings held at Hotel Rome, Riga', 30th March 1922, SCF archives, collection EJ255, box A0413.

breaking foods down into nutrients, they can be logistically managed, planned in separation, and then reassembled in the locale.

This was the idea behind Maltavena, another food used in post-war relief, which had more of a legacy than protein hydrolysates, or even vitamin pills. Maltavena was a weaning food or pap, designed for young children and conceived to supplement the scanty milk supply. The original formula was devised by the chemist at the Peroni brewery in Rome, at the behest of a Red Cross worker called Bernard Ward Perkins. Perkins was one of those fascinating characters that punctuate the history of relief: bursting with enthusiasm and liberal with his ideas as well as his letter writing. A correspondent at the British Ministry of Food described him as 'an extraordinary old boy, [who] first popped up with his Maltavena when he was working in Rome on an honourary basis for the British Red Cross... He is an enthusiast who knows little about nutrition and much of his knowledge is wrong anyway. Through sheer force of character he had introduced certain notable people in Maltavena'. [96] His force of character certainly worked. Interest in Maltavena punctuates the post-war files of several prominent aid agencies, and the concept had a considerable impact in later years.[97]

Maltavena was an infant food made from malted cereal grains. The original prototype, known as the 'Caprino formula' was developed in 1944. It involved taking powdered malt, soaking it with oats in hot water, and straining the wort through a linen cloth. This left a pale yellow liquid, sweet to the taste, which could be used as a milk substitute, or thickened with more oats to form a weaning food.[98] The idea was

[96] Letter from M. Pyke, Ministry of Food, to A. Bour, Welfare Foods Division, 11th November 1946, Archives of the Ministry of Food, MAF 256/93, National Archives, London, UK.
[97] Maltavena appears in the archives of UNRRA, the Friends Relief Service, the British Red Cross, the British Ministry of Food, and the War Office. As we will see below, it had an impact on high modernist nutrition.
[98] Typed memo from Dr. Moran to Miss Ritchie, 21st March 1945, Archives of the Ministry of Food, MAF 256/93, National Archives, London, UK. This is the original formula noted by Perkins, and developed with Dr. Caprino.

to produce a substitute for milk, which could be produced cheaply across the continent and which had practical and nutritional justifications. Practically, its ingredients and manufacture were designed to be adaptable for any brewery: the use of malted grains, the mashing, and the filtering of liquid were procedures familiar to any brewer, and there were plenty of breweries still operational after the war. Nutritionally, it was believed that young children would find it easier to digest and absorb this fluid, because the starch in the cereal had been broken down during the malting and soaking process – very much as it would do in the digestive tract.[99]

The idea of an innovative alternative to milk, which could be manufactured in any continental brewery, was an attractive one, but the basics of this product were hardly new. There had been a vibrant commercial market for milk substitutes since the Victorian times, and by the 1940s, there were a number of products on the market that looked very similar to Maltavena.[100] Cerex, manufactured by Cow and Gate, was based on malted cereal flour and designed as a milk substitute. Allenbury's malted food was similar, distributed through pharmacies as an infant food. 'Benger's Food' was a bit different, as it was designed for the infirm, but it declared itself as 'self-digested' and easy to absorb, on the basis that the starches had already been broken down (which had been the product's selling point since the late-Victorian era). The principles behind Maltavena, therefore, were not original, and its conception was likely to have been inspired by a number of existing products. In fact, some of these products were more important to the post-war relief effort than Maltavena ever was:

[99] 'Background Letter no. 63', 9th December 1948, attached to lecture notes delivered in Gottingen by R. F. A. Dean in January 1949. Issued by the Ministry of Supply as translation T.P 523. Archives of the Foreign Office, FO 943/470, National Archives, London, UK.
[100] Rima Apple, *Mothers and medicine: a social history of infant feeding, 1890-1950* (Madison: University of Wisconsin Press, 1987); Deborah Valenze, *Milk: a local and global history* (New Haven: Yale University Press, 2011), 178-98.

UNRRA procured Cerex and Allenbury's malted food when Maltavena was not even in production.[101]

In fact, it was 1948 before Europe saw Maltavena manufactured on a significant scale. The Caprino formula had been first used in 1944 in Rome, when Perkins was trying to replicate an earlier soya milk-based feeding programme in China, but he only used it to feed around thirty children.[102] In 1945, it was passed onto the British Ministry of Food, who gave the formula to the Guinness brewery in Park Royal for testing. They adjusted it, adding wheat flour and skimmed milk, and then developed guidelines for other breweries on its manufacture.[103] The formula was tested on rats at UNRRA's request, and trialled at Great Ormond Street Hospital. [104] In 1946, it was used in Dortmund, manufactured in the Union Brewery and distributed by the Friends Relief Services.[105] By 1948, manufacture on a larger scale had begun, as part of a project by the British Medical Research Council. The MRC, as we have seen, worked in post-war Europe experimenting with famine formulae and relief schemes. Working with a German company in Hamburg, they produced a version of the Caprino formula called Lactavena, in much larger quantities. A sample was sent to London for some tests, but after a committee of ten scientific advisers had examined and tasted the product, they concluded that it was unpalatable, unpleasant, with 'an

[101] Teleprints concerning procurement for UNRRA between Jack Drummond, Scientific Adviser to the Ministry of Food, and A. D Thomas of the Manufactured Foods Division, Archives of the Ministry of Food, MAF 256/93.
[102] Egon Larsen, 'Maltavena: the story of a new milk substitute,' *Chamber's Journal*, December 1946, 661; 'Our London Correspondence', *The Manchester Guardian*, 14 May 1946, 4.
[103] 'The Caprino Formula for Baby Food', undated memo c. 1945, Archives of the Ministry of Food, MAF 256/93. 'Suggested Procedure for Making Malt Extract and Cereal Product Suitable for Emergency Infant Feeding', by O.J Virden, Chemist at Guinness Park Royal Brewery, undated, but c.1945, Archives of the Ministry of Food, MAF 256/93.
[104] Harriette Chick and E. B. Slack, 'Malted foods for babies: trials with young rats', *The Lancet* 248, no. 6426 (1946); 'Brewing 'milk' for babies: Ruhr experiment with malted wheat and soya flour', *The Manchester Guardian*, 8 April 1946, 5.
[105] Although the extent of this experiment is unclear, it was reported in British newspapers and appears in relief worker memoirs. 'Brewing 'milk' for babies: Ruhr experiment with malted wheat and soya flour'; Grigor McClelland, *Embers of war: letters from a Quaker relief worker in war-torn Germany* (London: British Academic Press, 1997), 101-23.

unattractive greyish appearance' when reconstituted.[106] Perkins thought that the sample had gone off, or been damaged during transportation, noting wryly: 'it is pretty sure that the sample tested had gone sour… the Germans seem to specialise in things that go that way'.[107]

There is little doubt that Maltavena had a very limited role in post-war relief: it appears only rarely in relief worker memoirs, and would have been a small contribution to DP food needs.[108] Yet it has more significance as an idea. It was attractive because it was portable, offering an innovative logistical solution. It was developed in response to a shortage of milk in post-war Europe, but no shortage of breweries. This set it apart from the various commercial milk-substitutes. By being non-proprietary, it was *more* portable. By being flexible, it could be adapted and made in any brewery. It shares a tradition with military rations and canned food because it was a primarily practical response: made possible by logistical power, local resources, and the requisitioning of other supplies.

Towards high modernism

Maltavena also anticipated the next era. In its understated way, it indicated something new: a visionary approach, which sought a clean break with the past. With scientific authority it claimed to be easy to digest for infants, and was conceived as a man-made alternative to milk, even an improvement on milk. It was therefore

[106] 'Second Interim Report on the Caprino Formula Milk Substitute Food for Infants (Maltavena)', 16th July 1945, Archives of the Ministry of Food, MAF 256/93. Lecture notes delivered in Gottingen by R. F. A. Dean in January 1949. Issued by the Ministry of Supply as translation T.P 523, Archives of the Foreign Office, FO 943/470. Letter from P.H. Smith at the Ministry of Food, to Mr. Laurie at the Foreign Office, 23rd November 1949, and attached test report, dated 18th November and signed by R.G Macintosh, FO 943/470.

[107] Letter from Perkins to Miss Canney, 21st May 1950, Archives of the Colonial Office, CO 859/233/2, National Archives, London, UK.

[108] Maltavena appears only directly in McClelland's memoir, and since it was only manufactured on a large scale in the Ruhr, and not until 1948, it is unlikely to have been very important to the daily practice of relief. McClelland, *Embers of war*, 118.

connected with a new era of nutrition, which began in the late 1940s: high modernism. As we shall see in the next chapter, high modernism featured technologically advanced foods, the power of science, the taming of nature, and grand schemes to manufacture edible material from unusual sources. It promoted artificially manufactured proteins, and suggested profound changes to the human diet. Maltavena – like protein hydrolysates – anticipated this new era. It seemed to offer a man-made solution to starvation, a scientific cure for world hunger. To its advocates, it was improving on nature, representing a monument to human ingenuity.

Indeed, due to their modernist overtones, Maltavena and protein hydrolysates generated a great deal of excitement in the post-war world. In Dachau, for example, Marcus Smith heard that a wonder drug had emerged, a product that allowed starved people to eat normally in 72 hours. Given the problem of re-feeding, this generated considerable excitement: starving people wanted rich food, they wanted to gorge themselves, and this drug allowed them to do so.[109] But like Francesca Wilson's story of the 'crown piece'-sized meal, the idea was an exaggerated rumour. The re-feeding 'wonder drug' was probably a twisted reference to protein hydrolysates (just like the tiny meals were a reference to Multi-Purpose Food, which is considered in the next chapter). In the end, the anecdote tells us more about modernist hopes than it does about historical fact or contemporary technological possibilities. It shows how aid workers had begun to believe that technology could end hunger, constituting a transition between the efficiency- and order-obsessed militaristic aid of the 1930s and 1940s, and the science- and progress-obsessed high modernism of the 1950s and 1960s.

Maltavena is a particularly good illustration of this transition. It not only contained elements of both approaches, but it also inspired the high modernist

[109] Smith, *Dachau*, 208.

movement towards fortified blended flours. At the end of the 1940s RFA Dean, who worked with Maltavena in the Ruhr, wrote a proposal to examine the use of a Maltavena-type formula in the tropics.[110] He moved to Makerere University in Uganda, and began researching a local treatment for 'fatty liver disease' (later popularised as kwashiorkor).[111] His proposal was explicitly articulated as a way of testing the efficacy of Maltavena and developing a local equivalent (since the developing world had fewer breweries and different local grains). In the end, Dean stayed in Uganda for many years, and wrote a number of papers on milk substitutes and the therapeutic treatment of starvation. The idea of a milk substitute soon bloomed into a profusion of 'miracle' weaning foods made from local ingredients, and just as Maltavena had appealed to relief workers because it was easily digested and nutritionally balanced, these same concerns began to generate a wider search for fortified blended flours.

Conclusion

In this chapter I have argued that interwar relief was characterised by order, efficiency, and mobility. Looking at nutritional practice between the Russian Famine and the end of the Second World War, I suggested that humanitarianism had three main features. First, it relied on a carefully ordered 'soup kitchen' model of relief. Second, it featured a preoccupation with efficiency, which can be seen in the counting of calories and the deconstruction of diets. Finally, it depended on the ability to transport foods from place to place through canning, drying, and a reductionist approach to food. Taken together, I suggested that these constitute a militaristic kind

[110] 'Proposed fieldwork in Uganda by R.F.A. Dean and assistant', c.1949, Archives of the Colonial Office, CO 859/233/2.
[111] For more on kwashiorkor and the controversy surrounding its nomenclature, see chapter seven.

of top-down control, which is backed by the frequent crossover between military and humanitarian practices. As we have seen, humanitarian trainings drew on military handbooks, humanitarian feeding resembled military rations, and humanitarian distributions resembled military logistics. If we return to the post-war memoirs with which I began this chapter, we can see how humanitarianism in the DP camps built on military methods: the camps, the surplus rations, the calorific requirements, the registration; even the therapeutic feeding that was trialled on Belsen inmates had been implemented by the Royal Army Medical Corps.

At one level, my aim in this chapter has been to show how humanitarian nutrition is built on much more traditional, controlling notions of power than Foucauldian approaches would allow. The idea of biopower has become a staple in academic studies of relief, but I have argued that humanitarianism relies on a number of top-down, paternalistic practices, which are embedded in military values of order and efficiency.[112] Advocates of the 'humanitarianism as biopower' perspective might retort that this is all very well, but humanitarianism has changed a great deal since then; they might respond that aid work may have been controlling and paternalistic in the past, but that it relies more on self-government today. However, it is a mistake to think that these features have disappeared from relief. If we look at humanitarian action today, we can see a great many militaristic characteristics. Rations are still broken down by their nutrient value.[113] Calorific requirements are still adjusted by activity level, from 'moderate' to 'heavy'.[114] Dry rations are still distributed in a

[112] The idea of biopower has been used in many different ways, so is a rather diffuse target for critique. Mark Duffield, for example, sees humanitarian organisations as part of a new form of sovereignty, a 'liberal peace' that uses biopolitical strategies to manage unstable 'borderlands'. Other authors use biopower to analyse particular humanitarian techniques. See Vinh-Kim Nguyen, *The republic of therapy: triage and sovereignty in West Africa's time of AIDS* (Durham: Duke University Press, 2010); Peter Redfield, 'Doctors, borders, and life in crisis', *Cultural Anthropology* 20, no. 3 (2005); Didier Fassin, 'The Biopolitics of Otherness: undocumented foreigners and racial discrimination in French public debate', *Anthropology Today* 17, no. 1 (2001).
[113] Sphere Project, *Humanitarian Charter and Minimum Standards*, 189.
[114] World Health Organization, *The management of nutrition in major emergencies*, 144.

tightly controlled space.[115] Ration cards still resemble feeding tickets.[116] Humanitarian handbooks still resemble military handbooks – even those from the 1920s – and perhaps most tellingly, a number of emergency foods are based on Western army rations, produced by the same companies and distributed by the military.[117]

This chapter has shown how such humanitarian technologies did not emerge seamlessly from scientific experiment and objective reasoning, but from political circumstances, personal politics, and cultural predilections. By looking back at the 1930s and 1940s, I have opened up the 'black box' of fortified foods, showing how these objects emerged from military techniques – and also identifying this as a key theme in the evolution of relief. By showing how nutritionists and relief workers viewed food, I have also indicated some of the ways food was *redefined* in the twentieth century. I have also contributed to the historical sociology of humanitarian nutrition, not just by making a historical argument – in pointing out how aid in the 1930s and 1940s was tightly controlled and paternalistic – but also by suggesting these characteristics continue to shape humanitarianism today. I will return to these arguments later on, but first I move to the next theme in my historical narrative: the high modernism of the 1950s and 1960s.

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[115] *The management of nutrition in major emergencies*, 66.
[116] UNHCR, *Handbook for emergencies*, 127.
[117] The Humanitarian Daily Ration, for example, is based on the U.S army 'Meals, Ready to Eat'. It became particularly notorious during the 2001-2 Afghan war because it was dropped by American warplanes and wrapped in yellow plastic – looking, on the ground, very much like cluster munitions. For many humanitarians, this represented the military's increasingly dangerous embrace: army warplanes were dropping bombs one moment, rations the next, with little difference in the packaging. See Woodward, 'Humanitarian war'; Sarah Kenyon Lischer, 'Military Intervention and the Humanitarian "Force Multiplier"', *Global Governance: A Review of Multilateralism and International Organizations* 13, no. 1 (2007).

5.

A 'third age' of man?

High modernism and emergency foods

In the late 1950s, British Petroleum began developing a new kind of food. It was called Single Cell Protein, and was produced by feeding fungi on gas oil. The fungi consumed the wax in the oil, and expanded to become a protein-rich biomass. This strange process was originally developed to make oil easier to pour, but very quickly, the BP technicians became more interested in the by-product than the de-waxing process itself. By the beginning of the 1960s, it was agreed that the fungi-based protein could become a cheap source of new food. By the end of the 1960s, officials were preparing to certify it for human consumption. By the early 1970s, Single Cell Protein had become a growth industry, with hundreds of millions of dollars invested, and industrial plants in several countries. Of the many newspaper reports regarding this development, one article in the *New York Times* included a particularly vivid opening:

> In the dank basement of a laboratory on Long Island, a research scientist crouched before a glass cauldron filled with a yellowish translucent liquid that bubbled furiously beneath a bright light. 'Grow my darlings, grow,' he murmured. 'Are you warm enough? Want some more ammonia?' … Hours later the liquid in the vat had changed to a deeper, creamier yellow, richly opaque. 'Aha,' the scientist exclaimed, 'they're growing!' He then skimmed off a cupful of the liquid, held it at arm's length, grinned and pronounced, 'Food!'[1]

[1] Sandra Blakeslee, 'High-Protein Food, Created in Laboratories, Is Starting to Enter the Consumer's Diet', *New York Times*, March 1 1970; Yvonne Freita, 'Microbes help solve protein shortages', *The Times of India*, February 9 1969; J. W. Murray, 'A nice, tasty wooden steak', *The Observer*, March 1 1970; James Nagle, 'U.S industry set to feed the poor', *New York Times*, August 13 1967; Martin Sherwood, 'Single-cell protein comes of age', *New Scientist*, 28 November 1974; Victor McElheny, '1-cell protein sought for food', *The Washington Post*, October 12 1967.

Much of this rhetoric was steeped in the grand ideals of the era. The glamour of technology was combined with Frankenstein-inflected imagery of muttering scientists, nurturing new life in isolated laboratories. Within BP, there were motivational speeches, appeals to harness the power of science to solve malnutrition, and a sense of historical destiny.[2] One report declared Single Cell Proteins as the dawn of a 'third age' in the history of man: humans, it said, had fed themselves first through hunting and gathering, and then through husbandry and agriculture; the 'third age' of man would be characterised by the production of biosynthetic foods, which could be manufactured in industrial plants without dirt, work and weather.[3] Such food, BP emphasised, would be 'entirely under [man's] control', involving 'no soil, sunlight, or even assistance from human labour'.[4] Single Cell Protein, in other words, heralded nothing less than the beginning of a new era in food production, a transformation in our relationship to the environment. It was, in many ways, the classic, modernist dream.

High Modernism

The high modernist approach to nutrition dominated international efforts from the 1950s to the middle of the 1970s. It was a vision characterised by three features: the lionisation of science, the taming of nature, and an emphasis on elitist planning.[5] It

[2] For some (scientific) background on Single Cell Proteins, see Israel Goldberg, *Single cell protein* (Berlin: Springer-Verlag, 1985); Richard Mateles and Steven Tannenbaum, *Single-cell protein* (Cambridge: M.I.T. Press, 1968); Steven Tannenbaum and Daniel Wang, *Single-cell protein II* (Cambridge: M.I.T. Press, 1975). For the BP story, see James Bamberg, *British Petroleum and global oil, 1950-1975: the challenge of nationalism* (Cambridge: Cambridge University Press, 1982), 425-31.
[3] *British Petroleum and global oil*, 434.
[4] Nagle, 'U.S industry set to feed the poor'.
[5] The most comprehensive account of high modernism can be found in James Scott, *Seeing like a state: how certain schemes to improve the human condition have failed* (London: Yale University Press, 1998). Scott emphasises high modernism as a state-led phenomenon, whereas in this chapter I look at it as an idea that influenced non-governmental organisations, scientists, and international agencies. It shares the same features, particularly the quest to remake nature through science, and the capacity to ignore local objections to elite planning. It also has an aesthetic dimension, which is less obvious in this case, but still present. For more on this, see note 29.

celebrated science, which could produce a superior diet with fewer resources. It tamed nature, using industrial production to bypass the unpredictability of weather and human labour. It was preoccupied with legibility, breaking diets into precise nutritional formulae. Most importantly, it sought a blank slate, a clear break from traditional practices, pushing ahead into the new age of man: a bright, brave new world.

This period can be distinguished from an earlier era, which was shaped by military practices and preoccupied by order, efficiency and mobility. As I described in the last chapter, humanitarians between the wars began to view foods through their constituent nutrients, valuing the efficiency with which they contributed to driving the 'human motor'. In some cases, this valorised technology and sought a clean break from tradition – a good example is Maltavena – but in many cases it did not. Until the end of the Second World War, most humanitarians were simply packaging and preserving what was already available. Their concern was less about creating new, technological foodstuffs, and more about taking what there was and making it portable. There were, of course, new medical products, such as desiccated stomach and protein hydrolysates, but most distributions were recognisable to the recipients as whole, traditional foodstuffs: in the DP camps after the war, for example, rations of milk and meat were made into dried milk and spam, but these were still real foods, albeit packaged and preserved in new ways.

Such an approach to food can be termed a 'nutritional reductionist' perspective.[6] The calorific content of foods was calculated and valued on grounds of

[6] The idea of 'nutritional reductionism' has been used in many different ways over the years. Historically it appeared primarily in the ecology and anthropology literature. See, for example, Scott Cook, 'Production, ecology and economic anthropology: Notes toward an integrated frame of reference', *Social Science Information* 12, no. 1 (1973): 45-6. More recently it has been popularised by Gyorgy Scrinis and Michael Pollan. See Pollan, *In defence of food: the myth of nutrition and the pleasures of eating*, 62-3; Scrinis, 'Nutritionism and functional foods', 271. Here, I am giving the phrase a more specific, historical application, as a way of distinguishing an earlier approach from modernism.

efficiency. Such an approach, however, did not imply the need for radically new, modernist foodstuffs. In other words, it was quite possible to be a nutritional reductionist, without becoming a high modernist; in fact, nutritional reductionist perspectives persisted throughout the period of high modernism. A good example is the handbook published by the Food and Agriculture Organisation in 1965, which, far from recommending new, technological foods, argued that harmful habits were as likely to come from new technologies as from old superstitions.[7] The author of this handbook judged all foods dispassionately: no matter its form, origin, or cultural significance, no matter the widespread modernist enthusiasms of the time, diets were evaluated according to a single, universal criterion: the nutritional content. Foods favoured by 'sophisticates from the city' were no more or less valuable than locusts or lake flies; traditional superstitions were just as insidious as modern ones that favoured fashionable products from the West.[8] Here is an example of an author who valued food in purely nutritional terms, but did *not* seek to rearrange and reorder the world in quite such a radical way.

High modernism, however, sought sweeping changes; it worked to re-make the world. Nutritionists taking the modernist perspective designed new foods by isolating and rearranging nutrients, developing foods from previously unheard of sources. Such a perspective influenced the staff in many aid agencies, who had a deep respect for science and became inspired by the idea that an artificial, manufactured, and neatly packaged wonder-product might provide the solution to humanitarian crises. By focusing on two high modernist schemes – the emergence of new protein sources, and the development of multi-purpose foods – this chapter traces the rise and fall of high modernist ideas. It starts by describing the inception and development of

[7] Michael Latham, *Human nutrition in tropical Africa: a textbook for health workers with special reference to community health problems in East Africa* (Rome: Food and Agriculture Organization (FAO), 1965).
[8] *Human nutrition in tropical Africa*, 18.

these ideas, before considering their adoption by humanitarian actors. The central argument in this chapter is that high modernism left an indelible mark on humanitarian nutrition, and that the search for a perfect, technological solution to malnourishment remains a core component of humanitarianism today. Humanitarianism, in other words, remains persistently modern: indelibly marked by its mid-Century, modernist moment.

The rise of high modernism

Single Cell Protein was the archetypal high modernist food, fitting into the main preoccupations of the day. It confirmed oil as the source of human advancement, a crucial component of our future. It offered an unlimited supply of food from controlled, hygienic vats, promising a product that was freed from the vagaries of climate and toil in the fields. Moreover, it was a source of nutrition that reproduced itself remarkably efficiently, largely through its own devices. 'Where a calf may double its weight in four weeks, [and] a chicken in four days,' wrote one enthusiastic supporter of the new technique, 'a micro-organism can double its weight in four hours.'[9]

Yet Single Cell Protein was only one of many such schemes, which sought to generate protein-rich foods from oil, insects, algae, junk fish, and the leaves of non-edible plants. The aim was to find new, efficient and controllable food sources, which could help remove starvation from the world.[10] Often, the research was a hangover from the Second World War, when scientists investigated new food sources in the context of wartime shortage, and Leaf Protein Concentrate (LPC) – our next example

[9] J.H. Sheldon of Birds Eye, quoted in Colin Tudge, 'Food for the unthinking', *World Medicine*, June 5 1974, 35.
[10] Bamberg, *British Petroleum and global oil*, 427-9; A. Champagnat et al., 'Biosynthesis of Protein-Vitamin Concentrates from Petroleum ', *Nature* 197(1963); G. D. Kapsiotis, 'Single cell protein: review and assessment', *Food and Nutrition Quarterly* 4, no. 1-2 (1978).

– began in this way. It was based on the idea that protein could be extracted from the leaves of ordinary, non-edible plants, by pulping the leaves, extracting the liquid, boiling it, and filtering the protein that coagulated on the surface.[11]

The research was launched by a Cambridge biochemist called N.W Pirie, who developed the idea during unconnected research into plant viruses. Pirie had begun tasting the protein produced when centrifuging a mass of chloroplasts from the sap of plant leaves, and used to joke that it was perfectly good food.[12] Yet after a visit from a British government official during the war, with a specific request to instigate research into protein production, Pirie began taking seriously this topic. By the 1950s, Pirie was funded by the Agricultural Research Council of the UK, based at Rothamsted, and designing machines for large-scale leaf protein production. He developed leaf protein into two main forms. One was a wet, bright green, jelly-like curd, which perished easily but could be stored in cubes, refrigerated, like a 'moist green cake'.[13] The other was a dried, pale green powder, gritty and difficult to reconstitute. Pirie preferred the former, emphasising that he had consumed many pounds of it, and found it a perfectly acceptable food. Given its texture and colour, however, he acknowledged the difficulties of manufacturing a 'palatable and attractive product', and a number of his early papers were devoted to cooking leaf protein into something more aesthetically pleasing.[14]

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[11] The process is described particularly well in N.W Pirie, 'Leaf Protein as a Human Food', *International Journal of Food Sciences and Nutrition* 12, no. 1 (1958). See also N. W. Pirie, 'Leaf Proteins', *Annual Review of Plant Physiology* 10, no. 1 (1959); N.W Pirie, 'Leaf Protein as Human Food', *Nutrition Reviews* 18, no. 7 (1960).

[12] For an account of this history, see N.W. Pirie in Conversation with W.S. Pierpoint, 27 June 1988, at Film and Sound Online, Biochemical Society Collection: http://edina.ac.uk/purl/isan/0028-0000-2657-0000-0-0000-0000-0. See also Leslie Fowden and Stan Pierpoint, 'Obituary: Norman Pirie (1907-97)', *Nature* 387, no. 6633 (1997).

[13] Pirie, 'Leaf Protein as a Human Food', 19.

[14] J. Morrison and N.W. Pirie, 'The Presentation of Leaf Protein on the Table', *International Journal of Food Sciences and Nutrition* 14, no. 1 (1960): 8. See also M Byers, S.H Green, and N.W Pirie, 'The Presentation of Leaf Protein on the Table – II', *International Journal of Food Sciences and Nutrition* 19, no. 2 (1965); J. E. Morrison and N. W. Pirie, 'The large-scale production of protein from leaf extracts', *Journal of the Science of Food and Agriculture* 12, no. 1 (1961); N. W. Pirie, 'Leaf protein as a human food', *Science* 152, no. 3730 (1966); 'Leaf Proteins'.

The problem was, leaf protein made food an 'unappetising dark green colour' and gave 'the faeces a greenish tinge'.[15] Pirie sought ways around this by developing recipes that would be naturally green, suggesting 'finely pulped fresh leaves with strong flavours, e.g. parsley, mint, spinach, mustard, cress', which would seem less alarming.[16] He attended lectures with samples of his concoctions: one address at the Royal Society of Arts ended with biscuits, ravioli, and kromeski, and Pirie repeated his fondness for leaf protein ravioli in a number of other articles.[17] He developed 'cocktail snacks' made from leaf protein, which included 'flavoured leaf protein paste on a wafer', and 'deep fried leaf protein mixed with spice'. These were designed to interest 'well-fed visitors from ministries, embassies and international organisations', and were served to UN delegates to show them how leaf protein could be used.[18] Pirie's approach was 'to dispense with apology and try flavour combinations without regard to colour'. 'Conventional cooking techniques', he wrote, 'have a 50,000-year start, and it is hardly likely that we will catch up as a result of a few dozen trials; but it is already clear that the protein blends excellently with small amounts of the more fatty types of fish or cheese, and that a mixture of egg and leaf protein scrambles well and has a pleasant flavour and texture'.[19]

Despite these experiments with bourgeois cuisine, Pirie was more interested in making leaf protein work for the global poor. He became involved in the small-scale, community production in the developing world, with support from the International Biological Programme, and later, from Christian Aid.[20] Many of these programmes

[15] Morrison and Pirie, 'The Presentation of Leaf Protein on the Table', 8.
[16] Pirie, 'Leaf Protein as a Human Food', 20.
[17] N.W Pirie, 'World hunger as a biochemical problem', *Journal of the Royal Society of Arts* 106, no. 5053 (1958): 523; Jane Brody, 'The search for food', *New York Times*, July 24 1966.
[18] Morrison and Pirie, 'The Presentation of Leaf Protein on the Table'; N.W Pirie, 'The present position and future needs of research on leaf protein', in *Meeting protein needs of infants and preschool children*, ed. W. H Sebrell, (Washington D.C: National Academy of Sciences, 1960), 513.
[19] 'Leaf Protein as a Human Food', 20.
[20] N. W. Pirie, 'The production and use of leaf protein', *Proceedings of the nutrition society* 28, no. 1 (1969): 86. The Christian Aid project is detailed in the archives of Christian Aid, held at the School of Oriental and African Studies special collections, London, UK; boxes CA4/A/1, CA4/A/2, CA4/A/3, CA2/D/26 and CA4/D/27.

met with limited success, primarily because leaf protein remained a high modernist scheme: its aim, ultimately, was to revolutionise the diet and overthrow tradition, something illustrated particularly well in a lecture from 1958, entitled 'world hunger as a biochemical problem'. In this lecture, Pirie declared that the world was 'bigoted about the colour of proteins', and suggested that opposition to the bright colour of his product could be overcome if children in the developing world were brought up eating leaf protein from birth. 'If the people we now have to cater for will not eat a green food, we must bring up a group who will!' he declared: a classic example of the modernist disregard for cultural practices, and the desire to shape humans to fit with scientific order.[21] Even a 50,000-year history of dietary patterns was not enough to discourage Pirie and his colleagues from their work.

Proteins derived from petroleum and leaves were only part of the story. By the early 1960s, other programmes began exploring the viability of food supplements derived from junk fish, algae, and insects. Food from algae was perhaps the most modernist idea: it was first mooted in 1947, and for over a decade dominated technological visions of a world without hunger. As with Single Cell Protein grown on petrol, the attraction came from efficiency. Here was a food that could be grown all year round, one that multiplied rapidly, and one that converted energy from the sun through photosynthesis at a far superior rate. Scientists on this project lamented the inefficiency of more conventional crops: so much of the plant was inedible, they argued, so much of it wasted. In addition, the seeds sat for so long in the ground before the plant appeared to photosynthesise energy.[22] Proponents of algae-based foods argued these traditional crops were inefficient, and linked us with 'primitive man'.[23] They approached food 'as an engineer would', devising a whole new system

[21] Pirie, 'World hunger as a biochemical problem', 526.
[22] Richard Powell, Elizabeth Nevels, and Marion McDowell, 'Algae Feeding in Humans', *The Journal of Nutrition* 75, no. 1 (1961): 7.
[23] H. A Spoehr, 'The need for a new source of food', in *Algal culture: from laboratory to pilot plant*, ed. John Burlew, (Washington D.C: Carnegie Institution, 1953), 26.

for producing nutrients, returning to the very bottom of the food chain, and working with a primordial scum that could reproduce over a hundred times the average yield.[24] This was the stuff from which science fiction was made, and journalists lapped it up with greedy enthusiasm.

Indeed, there was something of the space age about this approach to food. The preferred algae, Chlorella, was grown on sewage, skimmed off, concentrated to a paste in a centrifuge, spread on an aluminium sheet, heated until dry, and then pounded into a fine powder.[25] The most revolting part of this process – the growth on sewage – was a key element of the modernist dream, for here was a food that did not produce waste, so much as consume it. Chlorella was seen as ideal for long distance space travel, since it could convert sewage into food, *and* produce oxygen at the same time, creating a complete aeronautic support system.[26] But this was also perceived as an ideal solution to global food shortage, especially in poorer areas of the world. Funds poured in from the Carnegie Institution, who headed its progress report of 1953, with the grand title: 'Algae to Feed Starving'.[27] The first monograph on Chlorella from the same year declared its importance for 'respite from famine' and providing 'more salutary conditions for civilised living'.[28] The nutrient content of Chlorella was examined in great depth, and its protein level and vitamin content

[24] The language of engineering is used in John Burlew, ed. *Algal culture: from laboratory to pilot plant*, (Washington D.C: Carnegie Institution, 1953). For more on the media reception of algae foods, see Warren Belasco, 'Algae Burgers for a Hungry World? The Rise and Fall of Chlorella Cuisine', *Technology and Culture* 38, no. 3 (1997).
[25] A good description of this process can be found in Bessie Cook, 'The Nutritive Value of Waste-Grown Algae', *American Journal of Public Health and the Nations Health* 52, no. 2 (1962): 244.
[26] H. A. Spoehr, 'Chlorella as a Source of Food', *Proceedings of the American Philosophical Society* 95, no. 1 (1951); Burlew, *Algal culture: from laboratory to pilot plant*, iii; Joseph A. Lubitz, 'The Protein Quality, Digestibility, and Composition of Algae, Chlorella 71105a', *Journal of Food Science* 28, no. 2 (1963).
[27] 'Algae to Feed Starving', *Science News Letter*, SNL, July 18, 1953, p. 35. Cited in Belasco, 'Algae Burgers for a Hungry World? The Rise and Fall of Chlorella Cuisine', 620.
[28] Burlew, *Algal culture: from laboratory to pilot plant*, v.

hailed as equal to meat. None of this took account of whether the food would be nice, and its nutrient content seemed enough to declare it the future of food.[29]

But experiments with human subjects soon revealed the unpalatable side of algae. By the end of the 1950s, only a few tests had taken place, with the most extensive experiments on malnourished Venezuelan lepers: a vivid demonstration of the era's dubious research ethics.[30] The lepers did not seem to complain about the 'plankton soup' they were served, even after being fed algae for five years, but later experiments in Japan, with algae noodles, and the US, with algae milk-and-cookies, revealed considerable disgust – always mediated by the detached, ever-hopeful language of the scientific journal.[31] Foods made with algae, the journals reported, turned bitter and alarmingly green. They were described in one paper as 'foodlike', but leading to 'a noticeable tightening at the back of the throat (gag factor)'.[32] The taste lingered for several hours, and led to 'difficulties in digestive function', spelled out in another paper as 'cramping pains' 'increased flatulence', and 'bowel excreta that had turned dark green in colour'.[33] Some papers suggested a way around this by recommending that algae should be treated like a herb or garnish, since 'its bright green colour would add interest if it were sprinkled on certain foods', but this was blind optimism.[34] The problems with taste, digestion, and even aesthetics were clear,

[29] For James Scott, high modernism has a powerful aesthetic dimension, with straight lines and ordered linear blocks having value in themselves, independent of their function. The same is true of modernism in nutrition. Although these foods seem disgusting, there was attractiveness in the ability to control food production, to grow it in stainless steel vats, to compact it into a pill. For modernists, growing knobbly carrots in mud and sweating to harvest them was the more unattractive technique of producing food.

[30] Jorgen Jorgensen and Jacinto Convit, 'Cultivation of Complexes of Algae with Other Fresh-Water Microorganisms in the Tropics', in *Algal culture: from laboratory to pilot plant*, ed. John Burlew, (Washington D.C: Carnegie Institution, 1953), 195.

[31] Hiroshi Tamiya, 'Mass Culture of Algae', *Annual Review of Plant Physiology* 8, no. 1 (1957): 328; Powell, Nevels, and McDowell, 'Algae Feeding in Humans'.

[32] A. W. Fisher and J. Burlew, 'Nutritional Value of Microscopic Algae', in *Algal culture*, ed. John Burlew, (Washington D.C: Carnegie Institution, 1953), 310.

[33] Robert Krauss, 'Mass Culture of Algae for Food', *American Journal of Botany* 49, no. 4 (1962): 432; Powell, Nevels, and McDowell, 'Algae Feeding in Humans', 9.

[34] Fisher and Burlew, 'Nutritional Value of Microscopic Algae', 310.

and algae was shelved relatively early in the modernist era, disappearing from prominence by the middle of the 1960s.

All the same, blind optimism was the currency of high modernism, and even after its rejection by American research subjects, algae was still considered good enough to suggest as food for the starving.[35] When food is reduced to a nutritional calculation, such logic is commonplace: if something has some nutrient value, it can feed the starving of the world, even if rejected by research subjects. In the 1950s, Fish Protein Concentrate (FPC) was another great modernist hope, produced by mincing fish whole, dehydrating them, repeatedly centrifuging them into what was called 'wet cake', then heating and grinding the result.[36] This produced a fine powder, made from the whole fish, defatted and dehydrated, which was seen to have such an excellent nutritive profile – providing a great deal of protein, with a good balance of amino acids – that it was recommended as another food source that might help avert famine. But a similar fate befell FPC. Even after FAO, Unicef, and WHO promoted production plants around the world and subsidised a plant in Chile, the production of the protein-rich fish powder hit an obstacle.[37] In 1964, the United States Department of Food and Agriculture declared FPC unfit for human consumption, since it was made by pulverising the whole fish, including the scales, head, viscera, and bones. The product was not allowed for sale within the United States, despite extensive lobbying by the US bureau of Commercial Fisheries, but it was still deemed

[35] Powell, Nevels, and McDowell, 'Algae Feeding in Humans', 11. For more on the 1950s algae fetish, see Belasco, 'Algae Burgers for a Hungry World? The Rise and Fall of Chlorella Cuisine'; Warren Belasco, *Meals to come: a history of the future of food* (London: University of California Press, 2006), 166-218.
[36] For the full process, see 'Fish protein Concentrate', by M.L Windsor, Torrey Research Station, National archives, Kew, UK, Reference AY 9/39.
[37] Ernst Pariser et al., *Fish protein concentrate: panacea for protein malnutrition?* (Cambridge: MIT Press, 1978). See also Black, *Children first*, 159; Carpenter, *Protein and energy*, 162-68.

acceptable for sale *outside* the US: the programme, entitled 'food from the sea', was promoted as a transfer of technical expertise to the Third World.[38]

These new, modernist foods had a common starting point: they were based on the idea that malnutrition is a deficiency in nutrients, rather than food. They assumed that problems with cultural acceptability, aesthetics, or taste were minor obstacles to be brushed aside in the march of progress, and as a result, their aim was not really to produce food, but to produce nutrients instead; nutrients, on their own, in the absence of all the other qualities that make something a food. Their development was consistent with the dominant paradigm of the age: the erroneous idea of a worldwide 'protein gap'. This was not so much food production as protein production, as modernists sought to make nutrients, rather than harvest the foods that carried them.

Moreover, modernists often sought to manufacture not just proteins, but the essential amino acids *within* these proteins. They took nutritionism to a new level, reducing foods to ever more basic chemical components. In the early 1960s, for example, there was particular attention to lysine, an amino acid that could be manufactured synthetically and added to basic foods like wheat flour or maize.[39] Lysine was, for a short period, thought to be a magical ingredient, a superior kind of protein that accelerated human growth and advancement.[40] Some proteins, it was argued, are better than others, and the addition of lysine could transform proteins, it could 'correct them', improve them.[41] Scientists found ways to give proteins a score,

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[38] O. A Roels, 'Fish Protein Concentrate: history and trends in production', in *Production of Fish Protein Concentrate: Report and Proceedings*, ed. United Nations, (New York: United Nations, 1972), 3-11; Pariser et al., *Fish protein concentrate: panacea for protein malnutrition*; M. B. Wallerstein and E. R Pariser, 'Fish protein concentrate: a technological approach that failed', *Food and Nutrition Quarterly* 4, no. 1-2 (1978).

[39] The lysine enrichment project is detailed in the archives of the London School of Hygiene and Tropical Medicine, Nutrition/17/02/06/02-03. See also Elizabeth Orr, *The use of protein-rich foods for the relief of malnutrition in developing countries: an analysis of experience* (London: Tropical Products Institute, 1972), 2.

[40] This idea of remarkable properties rubbed off on the creators of the film *Jurassic Park*, in which dinosaurs were kept dependent on lysine pills.

[41] A. E. Harper, 'Balance and imbalance of amino acids', *Annals of the New York Academy of Sciences* 69, no. 5 (1958): 1026; See also E.E Howe, 'Summary of progress on the use of purified amino acids in

and lysine was a way to convert the 'low efficiency' protein found in bread, into the 'high efficiency' protein found in meat.[42] This ever-deeper method of improving and taming nature was pioneered on a large scale in India, chemically enhancing wheat and 'doubling the food value of cereals'.[43]

Fortified blended flours

In addition to new protein sources, high modernism also produced a far more durable product: fortified blended flours. These were not so much new foods, as old foods, rearranged into a new form. Unlike Single Cell Protein (SCP), or Leaf Protein Concentrate (LPC), they were not based around a single nutrient, but motivated by the desire for a perfectly balanced ration. Whereas SCP and LPC were just protein sources, fortified flours were a full meal, designed to be highly economical. Whereas SCP and LPC were a journalists' dream – fantastical, dramatic, amenable to portraits of scientists creating edible substances from algae and petrol – fortified blended flours were banal. They received much less media coverage, and were driven by pragmatic concerns: disposing surpluses, increasing efficiency, and rationalising aid by producing a lightweight, nutritionally balanced meal.[44]

The first example of Fortified Blended Flour was produced at Clifton's cafeteria, in downtown Los Angeles, during World War Two. Billed as 'the world's

foods', in *Meeting protein needs of infants and preschool children*, ed. W. H Sebrell, (Washington D.C: National Academy of Sciences, 1960); Carpenter, *Protein and energy*, 177-8.

[42] H. H. Mitchell and R. J Block, 'Some relationships between the amino acid contents of proteins and their nutritive values', *Journal of Biological Chemistry* 163, no. 3 (1946). 'High-Efficiency Protein to Attack Malnutrition', *New York Times*, November 17 1957.

[43] 'Doubling the food value of cereals', *The Times of India*, August 17 1958; 'Food value of rice can be raised', *The Times of India*, November 10 1957; 'Fighting malnutrition in tropical lands', *The Times of India*, January 12 1958.

[44] In many ways, this was a continuation of story from the previous chapter: the very practical concern to find durable, portable meals. Yet when science was introduced, there was a distinct move *away* from neatly arranged tins and packets of preserved foodstuffs, as found in K-rations or Pacific Packs, and *towards* a simple powder, a pile of grain in a pale straw colour. Like the new protein sources, this was a solution for the space age, when sustenance in the form of tablets, foil-wrapped bars, or powder seemed exactly what the future would hold.

largest café', it was run by a colourful local figure, Clifford Clinton, who ran his business on the principle of small margins and huge volumes. During the war, Clinton developed what he called the *Vita-Meal,* a five-cent plateful of soybeans, rice, meat and vegetables.[45] A self-consciously good citizen, he decided that no one should be turned away hungry, regardless of funds, and the vita-meal was offered to anyone unable to pay. It was a curious business model: part soup kitchen, part café, and it soon became a wider humanitarian experiment. Towards the end of the war, Clinton enlisted the assistance of a scientist from Caltech to convert his Vita-Meal into a cheaper, standardised product. Together, they came up with Multi-Purpose Food, or MPF: a pre-cooked, dehydrated powder, which was later distributed around the world as a humanitarian gesture, coordinated by a foundation called 'Meals for Millions'.[46]

Multi-Purpose Food was the first single-solution foodstuff. It was made from pre-cooked soy grits, with the addition of dehydrated vegetables, and was prepared by boiling into a thin gruel. It was packaged in a silver can, with a white label, emblazoned with huge letters: 'MPF'. The reverse of the can claimed that two ounces of the powder was equivalent to a quarter pound of beef, a glass of milk, a baked potato, and a dish of peas. This was a full meal in the form of gruel, a series of items reduced to their purely nutritive form.[47] When Clinton embarked on the project, he set out the following minimum requirements for MPF: three servings were to supply the full nutritional requirements of an adult; the food had to be quick to cook; it could require only the most rudimentary cooking equipment; it had to keep for up to a year; it was to cost no more than 3 cents a meal; it could not offend any religious principles;

[45] 'Life Visits Clifton's Cafeteria,' *Life*, November 27 1944.
[46] The Meals for Millions Foundation was devoted to distributing MPF in humanitarian crises. By 1962, the organisation could claim that it had distributed 62 million 2-ounce meals, and cans of the flour had been delivered to crises from Congo to Korea. See '5-ton food shipment sent to starving Congo', *Los Angeles Times*, Feburary 21 1961; For a self-congratulatory account, see Fred Hafner, 'Multi-Purpose Food: valuable aid to improved nutrition', *Soybean Digest*, June 1961.
[47] 'Meals for Millions, Soy, and Freedom from Hunger', Unpublished manuscript, Meals for Millions Foundation (2001), 21-2; Gladwin Hill, '3-cent 'meals' aid in famine areas', *New York Times*, August 21 1955.

and it had to be transported easily.[48] These principles encapsulate the main motivations of high-modernist nutrition, a succinct summary of its aims.

The principles governing the development of MPF were shared by the most successful of the fortified flours: Incaparina, which was developed in Central America in the early-1950s. This blend of maize, sorghum and cottonseed flour was designed to the same criteria as MPF: to be protein-rich, cheap, long lasting, and compatible with local tastes.[49] Since the local tastes in Central America were distinctive, it was promoted in a different manner. Whereas MPF emerged very much from the American wartime experience, promoted as the equivalent to meat, potatoes and peas, and widely used to stock bomb shelters as well as to export as aid, Incaparina was designed to be made into *atole*, a hot, corn-based Latin American drink. It was conceived as an alternative to milk for those unable to afford it, and its rationale was later articulated in egalitarian terms by the director of the Institute of Nutrition for Central America and Panama (INCAP), the institution in which it was devised:

> There was a need for a weaning food that could be recommended for malnourished mothers and children in a country where milk was too costly and in short supply. It was considered that, given the role of cow's milk in child nutrition in the US and most other industrialized countries, it would be the height of arrogance to deny developing countries the benefits of a nutritionally comparable food at the lowest practical cost.[50]

INCAP went through eight different prototypes before coming up with a formula that had the correct nutritional balance, as well as being commercially viable. It was far more complex than MPF (which was just soy grits combined with some

[48] Henry Borsook, 'We could feed the world,' *Engineering and Science*, December 1948, 9. 'Meals for Millions, Soy, and Freedom from Hunger', 20.
[49] Jorgen Jensen, 'Protein-Calorie Malnutrition and industrially processed weaning foods', in *Food and nutrition policy in a changing world*, ed. Jean Mayer and Johanna Dwyer, (New York: Oxford University Press, 1979), 224.
[50] Nevin Scrimshaw, 'The background and history of Incaparina', *Food and Nutrition Bulletin of the United Nations University* 2, no. 2 (1980): 1.

flavourings and dehydrated vegetables), and far more ambitious. To produce it, four main ingredients had to be separately heated or boiled in calcium hydroxide, ground, dried, and prepared into flours: maize, sorghum, cottonseed, and kikuyu grass. They then had to be mixed with Torula yeast, rice polishing, and a vitamin mix, and blended and ground again. The mix was then slurried in water and dried in a double drum drier, then an air drier, then run through a flaker. Finally, it was ready for bagging.[51]

In some ways Incaparina was a very ambitious project, more than Multi-Purpose Food had ever been. Whereas MPF was a single product, based on a limited number of ingredients, exported around the world in exactly the same tins, Incaparina was more of a concept, an idea, a minutely adjusted formula, which took different forms. It was not produced in one place, but was licensed to six Central American states. It went through eight years of development, and was produced according to a set of detailed guidelines. The project reports, available in several archives, contain a wealth of detailed research into the nutritional content of the formulae, its effect on malnourished patients, the way it changed the protein level in the blood, alongside descriptions of the drying, pre-cooking, and sifting processes.[52] Incaparina was the result of lengthy research, more connected to science than MPF, which remained the somewhat eccentric vision of a cafeteria owner.

The aim of all this was to produce an alternative to milk, a kind of synthetic milk, an improvement on the original therapeutic food. It would be cheaper: based on local cereals and vegetables. It would be widely available: produced in the tropics, where dairy farming was unsustainable. It would be more acceptable to different cultures: inserting itself into local traditions and dietary choices. One proponent of the

[51] 'Progress report on development of Vegetable Mixtures 9 and 10', written for INCAP donors, dated September 1958, Archives of the London School of Hygiene and Tropical Medicine, Nutrition/18/20/04, London, UK, pages 2-6.
[52] See, for example, the reports in the Archives of the London School of Hygiene and Tropical Medicine, Nutrition/18/20/04.

project declared that milk was 'an unsophisticated approach' to gaining protein, suggesting that it was disturbingly primitive, child-like, reminding us of our primate origins – a perspective, as Valenze and Atkins have ably documented, that was widespread in the twentieth century.[53] Technology, on the other hand, allowed for more 'sophisticated' approaches, and Incaparina offered something animals could not provide: something cheaper, more controllable, produced from lengthy research, and emerging from ambitious intentions.

It is one of the ironies of high modernism that such ambitious rhetoric delivered such modest results. In the end, Incaparina had a very narrow application: to produce a kind of super-gruel, a more nutritionally acceptable version of local staples. Its goal was 'that mothers substitute the starchy foods which are prepared in the form of gruels, by our Vegetable Mixture no. 9'.[54] This was a limited aim, given the grand visions of the era. It is almost paradoxical. Such technologically advanced research, such grand hopes and large budgets ended with such poverty of vision. Far from eradicating starvation, foods like Incaparina condemned the poor to their existing, limited diets. It involved the mass-production of a kind of 'gruel-plus', a value-added version of an already unacceptable diet. It was as though the dietary modernists could not imagine a world where people could eat a balanced diet of real foods, but instead tinkered and fortified their gruels, offering little more than a nutritionally complex version of an already-awful diet, which the poor had to rely upon, day in, day out, with little variation or addition.

[53] Richard Shaw, 'The Flour of San Vicente', *America's Monthly Magazine* 12, no. 2 (1960). Valenze, *Milk: a local and global history*; Peter Atkins, *Liquid materialities: a history of milk, science and the law* (Farnham: Ashgate, 2010).
[54] 'Progress report on development of Vegetable Mixtures 9 and 10'. Archives of the London School of Hygiene and Tropical Medicine, file Nutrition/18/20/04.

The apex of high modernism

Modernist ideas were taken up enthusiastically by humanitarian organisations in the mid to late-1960s. Visions that had previously existed in the realms of science moved to the world of NGOs, and the archives of these institutions are littered with newspaper cuttings, enthusiastically annotated, perusing the possibilities for development.[55] This was the apex of high modernism, where humanitarians channelled scientific advances into practical programmes of relief. Although interest in modernist food technology dated back to the end of the war (when, at the first meeting of the United Nations, Clifford Clinton managed to get his Multi-Purpose Food on the San Francisco Opera House menu), it only became a regular feature of relief in the middle of the 1960s, with Biafra, as usual, as the turning point.[56] Before they became a prominent feature of relief, however, fortified flours were first taken up as a development intervention, featuring in programmes of long-term behaviour change, not programmes of short-term assistance.

Fortified flours in development

As a development project, fortified blended flours were advocated for long-term use. They were conceived as an alternative to milk, where milk was scarce or missing. They were designed to be a food that would be bought and consumed all year round, not just in emergencies. This was the era of the 'protein fiasco', and as a result, promoting high-protein foods for young children was pushed from the very top

[55] Cover note on leaf protein, dated 16th October 1968, Oxfam archives, Bicester, Oxfordshire, DIR/2/3/2/57 and subsequent documents on documents on soya, cottonseed protein, Polymene, and quinoa; Christian Aid archives, file CA/C/13/10 on high protein biscuits and CA4/A/1 on leaf protein. For an earlier example, see Friend Relief Services articles and annotations on soya and plankton after WWII, Quaker archives, FRS/1992/41.
[56] Paul de Kruif, 'How we can feed Europe's hungry' *Reader's Digest*, September 1945, 50-2.

of the UN system. The 'protein gap' was presented not just as a challenge for health – 'the most serious and widespread nutritional disorder known to medical science' – but also as a challenge for world security, 'a threat to world peace and stability', which we 'ignore at our own peril'.[57]

There was an element of Western-centricity here, as a number of anthropologists have suggested. Protein was given disproportionate attention because it had become a Western obsession – this was a region where diets were dominated by meat and milk. After being constructed as the elixir of life, milk became a core component of relief supplies, with Unicef at the helm. In its earliest days, Unicef had been 'a kind of gigantic organisational udder', distributing milk as a humanitarian gesture.[58] It had been a proselytizer for milk, a worshipper of milk, which was presented as the key to nutrition. Its post-war programmes harnessed the power of milk drying, a new technology that allowed milk to be preserved and transported without refrigeration, at little cost, over large distances. But as the organisation moved to support local milk production, it transformed into a more development-focused organisation. From providing milk for emergency feeding in the 1940s, Unicef started funding cattle farming and the dairy industry in post-colonial states, with the idea, neatly summarised by one advisor, that 'civilization follows the cow'.[59]

For many reasons, supporting dairy industries proved rather limiting: cows do not thrive in tropical areas, and many cultures do not drink milk. But such was Unicef's devotion, that in the late 1950s they turned attention to 'milk alternatives', inspired in part by INCAP's director, Nevin Scrimshaw, who advocated local products and lobbied against milk imports. Scrimshaw encouraged Unicef to pour

[57] J. F Brock and M. Autret, *Kwashiorkor in Africa* (Geneva: World Health Organisation, 1952), 2. *International Action to Avert the Impending Protein Crisis* (New York: United Nations Advisory Committee on the Application of Science and Technology to Development, 1968), 5. See also Jensen, 'Protein-Calorie Malnutrition and industrially processed weaning foods', 226-7.
[58] Black, *Children first*, 141.
[59] *Children first*, 146. The advisor was Joseph Edwards. It is probably no coincidence that, with these sentiments, Edwards also worked for the Milk Marketing board in the UK.

money into high-protein foods and fortified blended flours. They were presented very much as a substitute for what remained, in many humanitarians' eyes, the ultimate nutritional tonic. But where climate or topography could not support dairy farming, something else would have to do. In Scrimshaw's view, cereals and legumes could provide a processed, enhanced, pre-cooked product, made to resemble – even improve upon – milk.

What followed was a veritable explosion in milk alternatives and industrially processed weaning foods. Incaparina remained the most prominent example, but by the middle of the 1960s, it was joined by an array of imitators and alternatives. In Lebanon there was L'Aubina, based on chickpeas, parboiled wheat, dried milk and bone ash, providing the same amount of protein as 'a roast leg of lamb'.[60] In Algeria there was Superamine, a mix of wheat, lentils, dried milk, and sugar.[61] In Ethiopia, there was Faffa, based on wheat, soy, and chickpea flours.[62] Sri Lanka had Thriposha, made from corn, soya, and dried milk, and India had Bal-Ahar, made from soy, cottonseed flour and peanut flour.[63] Most of these products emerged in the late 1960s: L'Aubina, Superamine, Bal-Amul and Faffa were launched to the market in 1967, Thriposha slightly later, in 1972. They were pre-cooked, ground, and designed for weaning; inspired by the Incaparina model, based on low-cost production, local

[60] Jane Brody, 'Protein supplement developed to fight malnutrition in young', *New York Times*, November 30 1967.
[61] E. M DeMaeyer, 'Processed weaning foods', in *Nutrition in preventive medicine: the major deficiency syndromes, epidemiology, and approaches to control*, ed. G.H. Beaton and J.M Bengoa, (Geneva: WHO, 1976), 402.
[62] A. H. Taba, 'Nutritional problems in the weaning period: report on a seminar in Addis Ababa, Ethiopia 3–15 March 1969', *Journal of Tropical Pediatrics* 16, no. 4 (1970): 217-18; Yngve Hofvander, 'North–South collaboration: a success story', *Journal of Tropical Pediatrics* 57, no. 5 (2011): 323; Jensen, 'Protein-Calorie Malnutrition and industrially processed weaning foods'. Hofvander's fuller report on Faffa is available online at http://www.oxfordjournals.org/our_journals/tropej/online/.
[63] Irwin Hornstein, "Thriposha: product and program," (Washington D.C: USAID, 1986). Badri Tandon, 'Supplementary nutrition: a case study from India', in *Nutrition policy implementation: issues and experience*, ed. Nevin Scrimshaw and Mitchel Wallerstein, (New York: Plenum, 1982).

ingredients, and a local name.[64] If civilization had previously followed the cow, it seemed that even higher civilizations would follow the Fortified Blended Flour.

So Incaparina became the father of fortified flours, spawning a significant brood. Its brand became increasingly well known, even appearing on advertisements for IBM in the middle of the 1960s.[65] These fortified, pre-cooked, high-protein foods were a classic development intervention in the modernist mould. They facilitated industrialisation, the creation of new factories, the scaling up of agriculture, and the development of new markets. The association with IBM also demonstrated their technical origins: computers, the advertisements claimed, 'helped scientists develop this lifesaving powder'.

As modernist interventions, these were not local so much as centralised. They were driven by the national government, with funding and technical support from the West. The Sri Lankan Ministry of Health, for example, instigated Thriposha, with funding from USAID and CARE. Incaparina was driven by INCAP: an organisation governed jointly by the Ministries of Health in six Central American countries, and was funded by the Rockefeller foundation. Faffa was established at the Ethiopian Nutrition Institute, with funding from Sweden, and Bal-Ahar was developed at a government-run research institute in Mysore, funded by Unesco and USAID.[66] The adoption of local names seems, at first glance, to disguise the modernising project, but when translated they reveal it. These products were marked by lionising toponyms, such as L'Aubina deriving from the American University of Beirut, and Incaparina derived from INCAP. They featured appeals to human improvement, such as Faffa,

[64] Scrimshaw was also an advisor on many of these projects – for example, in Mysore. Alan Berg, *Famine contained: notes and lessons from the Bihar experience* (Washington D.C: Brookings Institution, 1971), 118.
[65] 'Full-page display advertisement: 'IBM computer helps science save protein-starved children'', *New York Times*, March 9 1964, 15.
[66] Ibid, notes 59-63. The Mysore plant was part of the Indian government's Council of Scientific and Industrial Research. See G. Prasannappa et al., 'Precooked Bal-Ahar and Indian multi purpose food', *Journal of Food Science and Technology* 9, no. 4 (1972).

which means 'to grow big and strong', and sometimes channelled space-age functional simplicity, as in the bland description 'Bal-Ahar', which means, simply, 'baby food'.

Where the UN led, the NGOs followed. Oxfam, for example, maintained a strong interest in high-protein foods throughout the 1960s. In 1963, its director, Leslie Kirkley, created links with N.W Pirie at Rothamsted, the creator of leaf protein concentrate.[67] A memo was circulated later that year, with a list of possible projects.[68] Oxfam considered funding Jelliffe's research into kwashiorkor and Pirie's work on leaf proteins. They considered putting money into the distribution of Clinton's Multi-Purpose Food, as well as a British produced food called LYPRO. They were approached by an industrial consultant at Cambridge University, backed by a 'large industrial concern', for the development of a 'Bacterial Protein Food' grown on oil.[69] Oxfam even considered funding BP's research into Single Cell Proteins, although the memo, in a rather understated way, reflected that it was 'unlikely any financial assistance will be needed.'[70]

In the end, Oxfam proceeded with two projects, each involving local production of a high-protein food. In India, they worked with the Central Food Technological Research Institute in Mysore, supporting the research and testing of Bal-Ahar – a product that was later used in the Bihar famine.[71] In Kenya, they supported the production of a new food called Supro, made from maize and milk powder, which became a key component of school feeding programmes.[72] In the latter case, Oxfam also became a shareholder, the first time they had put money into a

[67] Frank Wokes 'Report on Operation Oasis', undated but c.1966, Oxfam archives, file DIR/2/3/2/57.
[68] Memo entitled 'Nutrition research project', dated May 1963, Oxfam archives, file DIR/2/3/2/57.
[69] R.M Belbin, 'Notes on a project to develop a Bacterial Protein Food' and associated correspondence, dated 3 April 1963. Oxfam archives, file DIR/2/3/2/57.
[70] 'Nutrition research project', Oxfam file DIR/2/3/2/57.
[71] Black, *A cause for our times*.
[72] This project was instigated in 1966, and is considered in more detail in chapter six. Oxfam archives, file DIR/2/3/2/54.

commercial operation. It was a move that, as we shall see in the next chapter, became something of a failure.[73] Indeed, such was Oxfam's commitment to high protein foods, that it made modernist foods part of their education work. In 1966, the organisation chartered a cruise ship to take British school children to Algeria, a tour that encompassed Oxfam projects and visiting lectures. A significant component of this trip, named 'Operation Oasis', involved classes on nutrition: Pirie's leaf protein was served in the ship's galley, grammar school girls cooked high-protein banana fritters, and participants commented on the Algerian children lining the roads to receive the modernising party, 'smiling bravely despite obvious poverty and malnutrition'.[74]

Oxfam's interest was mirrored in other humanitarian organisations; Christian Aid, for example, ran a decade-long leaf protein project in Nigeria. In the late 1960s, a young journalist, who had read about Pirie's work in a popular science book, approached the Christian Aid board and told them about the local production of leaf protein.[75] The idea was discussed in board meetings throughout the late 1960s, and by the early 1970s Christian Aid had launched some trials in South-western Nigeria. They enlisted a biochemist who had trained with Pirie, and a food technologist who was able to construct the machinery. They began testing local leaves and considering how to market the product.[76] The Nigerian leaf protein scheme ran until the end of the 1970s, and the evident enthusiasm for such dietary modernism is evident throughout the meeting minutes, as well as in Christian Aid's continued willingness to support

[73] Letter from M.H Rowntree (Chairman of Oxfam's executive committee) to V. Ezra (Director of Supro Laboratories), dated 12 September 1966. Oxfam archives, file DIR/2/3/2/54.
[74] 'Report on Operation Oasis', Oxfam archives, file DIR/2/3/2/57.
[75] The book was Elspeth Huxley, *Brave new victuals: an inquiry into modern food production* (London: Chatto & Windus, 1965), 98. See correspondence in file CA4/A/2, Christian Aid archives, SOAS special collections, London, UK.
[76] A fuller account of this project is provided in chapter six.

the project financially, long after the viability of the scheme had become highly questionable.[77]

Fortified flours in emergencies

Such projects were generally conceived as development rather than disaster interventions, committed to long-term change, rather than emergency feeding. By the time of Biafra, however, Fortified Blended Foods had become a central part of relief work, produced not just for local, long-term use, but shipped as an emergency supply. Two factors enabled this change.

First, the US government changed the emphasis of their 'food-for-peace' programme, channelling mounds of US-produced fortified flour, known as Corn-Soy-Milk, to disaster situations. 'Food for peace' began in 1954 to dispose of American agricultural surpluses, and had two main components. Title I was designed as a resource transfer to poor countries, allowing concessional sales of food to governments friendly with the US.[78] Title II provided food for famine relief, targeted at vulnerable people. The second component had a more humanitarian, rather than developmental, goal: its aim was to get food directly to the most malnourished, rather than through a government-to-government transfer. It operated by allowing USAID to purchase food on American commodity markets, which were given free, or at remarkably reduced prices, to humanitarian agencies for their emergency feeding programmes.[79] Until the middle of the 1960s, these purchases were of surplus

[77] For a more detailed discussion of this scheme, see chapter six, and Scott-Smith (forthcoming 2014), 'How projects rise and fall: the lifecycle of a dietary modernization scheme', *Development in Practice*.
[78] Hence the term, 'Food for Peace', which was introduced by Kennedy in the 1960s. For an overview, see Christopher Barrett and Daniel Maxwell, *Food aid after fifty years: recasting its role* (London: Routledge, 2005); Vernon Ruttan, 'The politics of U.S. Food Aid policy: a historical review', in *Why food aid?*, ed. Vernon Ruttan, (Baltimore: Johns Hopkins University Press, 1993); Vernon Ruttan, ed. *Why food aid?*, (Baltimore: Johns Hopkins University Press, 1993).
[79] These organisations were mostly US-based NGOs, such as CARE and CRS, or UN bodies, such as WFP and Unicef. See Robert R. Sullivan, 'The Politics of Altruism: An Introduction to the Food-for-

commodities, but in 1966, an amendment to the original law allowed for the purchase and export of commodities that were *not* in surplus, whilst also permitting the government to pay for processing, fortifying and blending foods.[80]

This was the beginning of the acronyms that are now so familiar to aid workers, so ubiquitous in locations like Yusuf Batil. It led to the production of Corn-Soy Blend (CSB), Wheat-Soy Blend (WSB), Wheat-Soy-Milk (WSM), and Soy-Fortified Bulghar (SFB).[81] Such products were the processed, enriched, and fortified mixtures of US agricultural commodities; they were mass-produced, American versions of the fortified flours previously pioneered in the global South. Before 1966, the food-for-peace title II programme only allowed the export of whole commodities in surplus, which meant mostly dried skim milk and grain, bagged up and delivered to humanitarian agencies. This led to many, obvious, criticisms – not least that the whole programme seemed more concerned about dumping surpluses than tackling malnutrition – so the new law allowed for a different kind of export. It enabled foods to be created specifically for feeding programmes, designed to meet nutritional needs. It shifted the terms of the programme from 'surplus liquidation' to 'deliberate production'.[82] It appeared to be led more by the biological requirements of suffering humans than the economic requirements of a global superpower. But as we will see in the next chapter, many criticisms remained: the content of these blends remained dictated by US agricultural production, they bound humanitarian relief inexorably

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Peace Partnership between the United States Government and Voluntary Relief Agencies', *The Western Political Quarterly* 23, no. 4 (1970).

[80] Thomas Marchione, 'Foods provided through U.S. government emergency food aid programs: policies and customs governing their formulation, selection and distribution', *Journal of Nutrition* 132, no. 7 (2002): 2106.

[81] For a list of commodities and blends currently available under the food for peace scheme, see USAID website http://www.usaid.gov/sites/default/files/documents/1866/Commodity%20Reference%20Guide%20Compiled.pdf

[82] Kristin Ahlberg, *Transplanting the great society: Lyndon Johnson and Food for Peace* (London: University of Missouri Press, 2008), 92.

with the global food system, and the law gave important business to the US blended foods industry, making it a far from altruistic act.[83]

The second factor was the changing role of aid agencies. The late 1960s was a period when many humanitarian organisations became operational in the Third World, acting as direct deliverers of aid rather than relying on local partners. Rather than raising funds and channelling these to governments or churches, they would move into territories and implement programmes themselves, establishing offices and employing locals. Oxfam, for example, had worked through grants to local organisations until 1967, when it began to run relief itself: first in the Bihar famine, then in Biafra the following year.[84] Unicef, similarly, had been a middleman – locating food surpluses and then transferring them to governments, or offering distant technical advice – but in Biafra it started to purchase trucks, employ staff, and distribute foods directly.[85] This trend towards direct operations occurred alongside the introduction of US-produced fortified flours. Suddenly, Western agencies needed stocks of food; they needed warehouses, inventories, and decisions about what to supply. If the old approach was to transfer money to local committees, who would buy local foods or invest in local projects, the new approach meant sourcing and distributing foods directly. This required cheap cereals, which could demonstrate efficiency as well value added.

Corn-Soy-Milk (CSM) was perfect for these roles. As a product of the 1966 'food for peace' legislation, it was a blend of the era's most abundant commodities: maize, soya, and milk. It was fortified with vitamins and minerals, and harnessed existing enthusiasms for high-protein foods.[86] First distributed in the Bihar famine of

[83] Shlomo Reutlinger, 'The value of PL 480: A fresh look at PL 480, Title II', *Food Policy* 8, no. 3 (1983).
[84] Black, *A cause for our times*; Peter Gill, *Drops in the ocean: the work of Oxfam 1960-1970* (London: Macdonald & Co, 1970)., 67.
[85] Interview with Strahinja Bacic, Unicef History Project, 17.
[86] G. F Combs, 'Development of a supplementary food mixture (CSM) for children'. *Protein Advisory Group Bulletin* 7 (1967), 15-24.

1966-67, by the time of Biafra, sacks of CSM had already become a nutritional mainstay in emergencies.[87] By the end of the war, the Red Cross was delivering and stockpiling CSM in unprecedented quantities: five times more than any other commodity, such as stockfish or dried milk.[88] The rise of CSM was so dramatic, that the space of a few years it came to dominate relief. A 1967 UN handbook on 'food and nutrition procedures in disaster', for example, made no mention of CSM or any other fortified food mixtures, but the handbooks in the 1970s and 1980s made fortified flours a key part of organisational policy.[89]

The fall of high modernism?

High modernism in humanitarian nutrition emerged in the 1950s, and by the early 1970s, it was still going strong. In 1971, a whole new subsidiary within BP had been created to manage its nutrition work called BP Proteins: manufacturing plants were built in Grangemouth in the UK, Lavera in France, and Sardinia in Italy, with plans for the production of 700,000 tons every year. SCP initiatives appeared in other companies, including Standard Oil, Nestle, ICI, Shell, and Rank Hovis McDougall.[90] There was competition from the other side of the Iron Curtain, as plants were founded across the USSR, and the first Single Cell Proteins were brought to the market as an

[87] Black, *Children first*, 268.
[88] 'Nigerian Red Cross Relief Action Operational Plan, 1st December 1969 – 31st March 1970', dated 9th December 1969. British Red Cross archives, file 1983/71. This report documented the use of CSM in areas of Biafra under Nigerian military control – e.g. around Enugu, Port Harcourt, and Uyo.
[89] Compare, for example, the 1980s Oxfam manuals on nutrition and 'Oxfam Feeding Kits' instruction booklets (held in file DIR/2/3/2/74, Oxfam archives) with G. B. Masefield, *Food and nutrition procedures in times of disaster* (Rome: Food and Agriculture Organization, 1967).
[90] Bamberg, *British Petroleum and global oil*, 424-35; Frazer Imrie, 'Single-cell protein from agricultural wastes', *New Scientist*, May 22 1975, 459; Robert Bud, *The uses of life: a history of biotechnology* (Cambridge: Cambridge University Press, 1993), 135-36.

alternative to animal fodder.[91] In 1972, the United Nations suggested that SCP would be available for human consumption within 3-5 years.[92]

A similar momentum was building with other fortified foods and protein sources. In the early 1970s there was over a hundred different fortified flours in production, from South Africa to Lebanon, Panama to Hong Kong.[93] The manufacture of Corn-Soy Blend in the United States was also growing, and leaf protein was just getting off the ground, with local projects launched in Nigeria, Mexico and India.[94] Food from algae may have lost its sheen, but there was more enthusiasm for foods from fish protein, with a new plant constructed in California in 1971, as well as interest in food from insects – a project led with enthusiasm by Dr. Ronald Taylor, author of the delightfully-titled *Butterflies in my Stomach*.[95]

Academic cliché has it that 1972 was a moment before the fall: the year when the modernist dream stood precariously, before crashing to earth along with the high-rise buildings of the Pruitt-Igoe housing project.[96] In some ways, the story of humanitarian nutrition mirrors this simplistic temporal scheme, with plenty of evidence to indicate a gradual ascent until 1972, followed by a rapid decline. In 1972, for example, major UN conferences were still referencing the protein gap, and recommending 'mass production of high-protein and multipurpose foods', but by 1974 the idea of a worldwide deficiency in proteins had been thoroughly undermined,

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[91] 'Soviet increasing output of fodder: it uses petroleum to grow single cell protein', *New York Times*, June 23 1973. *The uses of life: a history of biotechnology*, 136.
[92] United Nations Protein Advisory Group, 'PAG Guideline no. 12 on the Production of Single Cell Protein for Human Consumption' (New York: United Nations, 1972).
[93] Mitzner, Srimshaw, and Morgan. 'Improving the Nutritional Status of Children During the Weaning Period: A Manuel for Policymakers' (Washington D.C: USAID, 1984).
[94] Archives of Christian Aid, School of Oriental and African Studies special collections, London, UK; boxes CA4/A/1, CA4/A/2, CA4/A/3, CA2/D/26 and CA4/D/27.
[95] Ronald Taylor and John Tweed, *Butterflies in my stomach: insects in human nutrition* (Santa Barbara: Woodbridge Press, 1975). The closure of the fish protein plant is described in Carpenter, *Protein and energy*, 165.
[96] The opening of Charles Jencks, *The language of post-modern architecture* (London: Academy Editions, 1978). Other authors identify 1973 as the birth of postmodernity. See Fredric Jameson, *Postmodernism, or, The cultural logic of late capitalism* (London: Verso, 1991); Andreas Killen, *1973 nervous breakdown: Watergate, Warhol, and the birth of post-sixties America* (New York: Bloomsbury 2006).

encapsulated in McLaren's famous article, entitled 'the great protein fiasco'.[97] Similarly, the use of milk-substitutes was still seen as a progressive endeavour in 1972, with the local production of weaning foods promoted by the FAO and WHO, but, again, this was soon undermined by another famous article, entitled 'commerciogenic malnutrition', which criticised the introduction of commercial imperatives into infant feeding, and was followed by the first stirrings of the Nestle boycott.[98] Indeed, by the middle of the 1970s most of the new proteins had failed dramatically, and many of the factories for Fish Protein Concentrate and Single-Cell Protein had become white elephants: the BP plant in Sardinia was mired in corruption and regulatory censure, and the fish protein plant in California failed to produce any viable product, and was soon sold for scrap.[99] As if to underline this decline, over a hundred fortified flours were on the market at the beginning of the decade, but by the end of the 1970s there were only a handful left. Even Incaparina, the grandfather of fortified flours, ceased production in all but Guatemala by 1980.[100]

Wider, cultural shifts also point to a post-'72 decline. Schumacher's book *Small is Beautiful* criticised top-down, large-scale developmental planning, and was published in 1973. The growth of the intermediate technology movement emphasised local, small-scale, solutions, and had an impact on aid programmes, such as the leaf

[97] Report of the 1972 United Nations Conference on the Human Environment, Stockholm, 5-16 June 1972, Recommendation 13, page 8, on high-protein foods. It was McLaren's article that eventually buried this obsession. See Donald McLaren, 'The great protein fiasco', *The Lancet* 304, no. 7872 (1974). For more on the 'protein fiasco', particularly in relation to kwashiorkor, see chapter seven.
[98] 'Travelling seminar on protein foods in Africa organised by FAO and WHO'. *Protein Advisory Group Bulletin* 2 (1972), 36-8. Derrick Brian Jelliffe, 'Commerciogenic Malnutrition?', *Nutrition Reviews* 30, no. 9 (1972). For more on the impact of this article, see chapter six.
[99] Bamberg, *British Petroleum and Global Oil, 1950-1975: The Challenge of Nationalism*, 434. Kenneth Carpenter, *Protein and energy* (Cambridge: Cambridge University Press, 1994), 165. In the end, SCP had little use beyond animal feed, but it left some legacy in the meat-substitute Quorn, made using a similar process.
[100] Mitzner, Srimshaw, and Morgan. 'Improving the Nutritional Status of Children During the Weaning Period: A Manuel for Policymakers' (Washington D.C: USAID, 1984). Orr, *The use of protein-rich foods for the relief of malnutrition*, 47-8; Carpenter, *Protein and energy*, 174.

protein scheme in Nigeria.[101] Scepticism about industrial food also permeated popular culture. A good example is the big-budget blockbuster *Soylent Green*, starring Charlton Heston, which was released in 1973. This was set in a resource-starved, overpopulated, dystopian future, with most of the population living on processed food rations – including the eponymous Soylent Green. This claimed to be made from algae, but was really manufactured from human corpses – the growing suspicion with industrially produced, technologically-inflected foods was being captured by Hollywood, feeding a counter-culture of whole foods and organic agriculture, which emerged from the protest generation of 1968 and continues to this day.[102]

Conclusion

So what became of the 'third age of man'? All these factors point to a neat narrative arc of expansion and retraction, with 1972 as a turning point, when modernist approaches tailed off into a more dispersed, less technologically intensive, more localised future. Such a narrative, however, is misleading. Modernism in humanitarian nutrition has never gone away, leaving an enduring legacy, an indelible mark on policy. It is true that the more absurd instances of modernist food production never got off the ground, with diets from petrol, pulverised fish, and algae appearing more and more fantastical as the 1970s progressed. It is also true that many fortified flours failed in the 1970s, and that there was a reaction against top-down, centralised, modernist planning. But the idea of a wonder food never left the desks of humanitarian policy-makers. Corn-Soy Blend (CSB) Wheat-Soy Blend (WSB), Corn-Soy Milk (CSM), and Soy-Fortified Bulghar (SFB) have remained a mainstay of

[101] Many leaf protein schemes from the 1970s prioritised small-scale production over grand modernist designs, and even microbial protein projects were scaled back SCP to a more local, small-scale procedure. Imrie, 'Single-cell protein from agricultural wastes', 458.
[102] Warren Belasco, *Appetite for change: how the counterculture took on the food industry* (London: Cornell University Press, 2007).

relief supplies, and experiments continued with less extravagant food sources, seeking the perfectly balanced, perfectly packaged, completely convenient ration.

In this chapter, I showed how fortified foods grew out of the high modernist ideals of the mid-twentieth century. By questioning the grounds of these humanitarian technologies, I opened up the 'black box' that makes them seem objective, timeless solutions to malnourishment. I also indicated how they emerge from a set of political commitments – most importantly, the idea that the diets of the starving are open to 'rational' manipulation, as long as one can overcome the inherent resistance of traditional societies. These pre-cooked, fortified, industrially produced rations were made possible by transforming the deeply socio-political process of planting, reaping, selling, and cooking into a series of more technological solutions. From the mud, soil, and sweat of labour emerged a rationalised ideal, and food was redefined and redesigned accordingly. In the green jelly-like protein curd of LPC and the self-expanding biomass of SCP, we can find the roots of our current system – one that, as I shall argue, was built on a false modernist purification between nature and society. Even now, this purification persists: objects like the BP-5, F-100, and Plumpy'nut have become well-established features of the humanitarian landscape, their technical names revealing their modernist origins: the moment high science shaped disaster relief.

6.

Commerciogenic malnutrition

Market imperatives and emergency foods

The baby milk scandal began in 1974, with two incendiary publications. The first was a pamphlet by the British charity War on Want, entitled *The Baby Killer*; the second was a German translation called *Nestle Kills Babies*.[1] With these publications, the issue of infant formula exploded onto the international scene. Their authors claimed that manufacturers were aggressively promoting their products in the Third World: disguising salespeople as nurses, playing on mothers' anxieties over milk, and exploiting a close relationship with the medical profession. The result, the publications argued, was catastrophic. Sales of dried milk were soaring, placing an unneeded financial burden on poor families. Breastfeeding was going into decline, with mothers believing dried milk was better than breast milk. Most seriously, dried milk was prepared with dirty water and fed in unsterilized bottles, leading to illness, diarrhoea, and malnutrition. The impact of these publications was swift. In 1974, Nestle sued the publishers of the German pamphlet for libel. The following year, a campaigning documentary was released called *Bottle Babies*. By 1977, the Nestle boycott was launched, starting with a student group in Minnesota and spreading to many other countries.[2]

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[1] Mike Muller, 'The baby killer: a War on Want investigation into the promotion and sale of powdered baby milks in the Third World' (London: War on Want, 1974). The German translation was published by the Bern Third World Action Group and entitled 'Nestlé tötet babys', (Bern: Arbeitsgruppe Dritte Welt Bern (AgDW) 1974).

[2] The film was called *Bottle Babies*, made by Peter Krieg. The student group who launched the boycott was the Infant Formula Action Coalition (INFACT). For full background see Naomi Baumslag and Dia Michels, *Milk, money, and madness: the culture and politics of breastfeeding* (London: Bergin & Garvey, 1995); Judith Richter, *Holding corporations accountable: corporate conduct, international codes, and citizen action* (London: Zed Books, 2001), 44-59; Andrew Chetley, *The politics of baby foods: successful challenges to an international marketing strategy* (London: Pinter, 1986); Andy Chetley, *The baby killer scandal: a War on Want investigation into the promotion and sale of powdered baby milks in the third world* (London: War on Want, 1979); Apple, *Mothers and medicine: a social history of infant feeding, 1890-1950*.

The dramatic discourse of 'baby killers' certainly launched the campaign, but the problems with infant formula had been raised in a more understated manner a few years earlier. In the late 1960s, the paediatrician Derrick Jelliffe asked for a 'dialogue' with food corporations, raising the problems with marketing dried milk, but acknowledging the positive role food companies could play.[3] He saw particular potential in the power of advertising, which he believed could be harnessed for positive uses – calling them 'immense forces for nutritional persuasion'. But after a series of closed meetings with food corporations, Jelliffe's publications were filled with more passion and urgency. The food companies, it seemed, were uninterested in a dialogue, reluctant to change their practices. Jelliffe founded a pressure group for breastfeeding, and used his facility for language to express the problems with the milk industry.[4] He sardonically described the milk powder as 'a method of instantaneous transport into the twenty-first century of satellites, moon probes and heart transplants'. He described the mix of insufficient powder with filthy water as a 'homeopathic dose of milk, administered with large quantities of bacteria'. His vivid and colourful language was even evident in the titles of papers. In one particularly important article he coined the phrase, 'Commerciogenic Malnutrition', which he defined as 'malnutrition caused by the thoughtless promotion of milks and infant foods'.[5]

At first glance this seems a cumbersome, ugly phrase – too lengthy, to unwieldy, too tortured on the tongue – but a closer look reveals its uses. It lent the campaign materials of the baby milk campaign a nicely formal tone, a serious label for its topic.[6] It had an air of respectability, appearing in medical textbooks to

[3] D. B. Jelliffe, 'Commerciogenic Malnutrition: time for a dialogue?', *Food Technology* 25(1971). This paper was based on a conference presentation given in 1968.
[4] Jelliffe, 'Commerciogenic Malnutrition?'. With his wife Patrice, he helped found the World Alliance for Breastfeeding Action, a key partner in the boycott.
[5] 'Commerciogenic Malnutrition?', 200-1.
[6] See, for example, its incorporation into the War on Want pamphlet, Muller, 'The baby killer', 10.

describe diarrhoea caused by the improper use of dried milk. It was also flexible, and could be applied to some related problems. Popkin and Latham, for example, used it to criticise high-protein weaning foods, remarking acidly: 'there is still a general feeling that the giant food conglomerates are capable of great deeds through various innovative techniques, imaginative advertising, demand manipulation, sophisticated packaging, skilled distribution, and other mystical techniques that have been successful in selling refrigerators to the Eskimos and spaghetti to the Italians.'[7] The title of their paper, mimicking Jelliffe's, was 'Commerciogenic Nutritious Foods', showing how the phrase could be transferred to other concerns – not just baby milk, but high-protein flours and mixes, which, as we saw in the last chapter, took the world of humanitarian nutrition by storm in the 1960s.

Even useful phrases die off, especially ugly ones. After a moment in the sun, 'commerciogenic malnutrition' fell from use. Its referent was too narrow, its syllables too numerous, and there were many more memorable ways to describe deaths from baby milk, such as the phrase 'baby bottle disease', which proved to be far more popular.[8] All the same, my aim in this chapter is to breathe life back into this phrase. I believe it is particularly useful because it encapsulates the complex relationship between hunger and the market, going far beyond its original, narrow application to baby milk. For a start, there are many ways commerce can create malnourishment. Markets generate poverty and hunger in more structural ways, something particularly true in the contemporary global food system, which is reliant on Fordist production, dominated by agribusiness, and addicted to huge quantities of just four main commodities: wheat, rice, corn, and soy.[9] But the phrase 'commerciogenic

[7] Barry M. Popkin and Michael C. Latham, 'The limitations and dangers of commerciogenic nutritious foods', *The American Journal of Clinical Nutrition* 26, no. 9 (1973): 1017.
[8] Committee on Nutrition American Academy of Pediatrics, *Pediatric nutrition handbook* (Elk Grove Village: American Academy of Pediatrics, 1993), 145.
[9] In this chapter, I use the term 'global food system' to refer to the globalised network of food production and transportation. The term was popularised by John Warnock, *The politics of hunger: the global food system* (London: Methuen, 1987). It is now commonplace, especially as a term used by

malnutrition' is also useful because it can include connections between malnutrition and commerce that flow the other way. In its original application, this phrase designated a one-way causal relationship – commerce that generates malnutrition – but as I will show in the next section, the opposite is also true. Malnutrition can also generate commerce.

Commerciogenic malnutrition: a reappraisal

The suffix '–genic' has two somewhat contradictory meanings. On the one hand, it means producing or generating something. If we describe something as 'carcinogenic', for example, we are identifying a cancer-causing agent. But if we describe something as 'cryptogenic', we see a different use of the suffix come into play. In this case, the suffix comes to mean 'produced *by*, 'generated *by'*; something 'cryptogenic' is produced by mysterious means. These, in a way, are opposite uses, describing different sides of a causal relationship. In the first example, the suffix is attached to the final result – to cancer. In the second, the suffix is attached to the cause – something unknown. There is also a third use of the suffix, which is more general: something suitable for production in a particular medium. The word 'photogenic' is a good example, as it describes an object that is good for production in a photographic format.

Derrick Jelliffe clearly intended his term in the second sense, attaching the suffix to the cause and creating a word that meant 'produced *by*', generated *by*'. Commerciogenic malnutrition, in his definition, meant malnutrition that was caused by commerce; in fact, its meaning was even more restrictive, coming to mean a

critics of the food system, although perhaps a more accurate term is 'the international political economy of food'. Harriet Friedmann, 'The international political economy of food: a global crisis', in *Food in the USA: a reader*, ed. Carole Counihan, (New York: Routledge, 2002). However, this misses the cultural dimensions of the system, which are covered in Richard Wilk, ed. *Fast food/slow food: the cultural economy of the global food system*, (Plymouth: Altamira, 2006).

specific form of malnutrition caused by a specific form of commerce. But staying true to this term, we can broaden the meaning to designate other relationships between commerce and malnutrition. We can use it to designate not just malnutrition generated by commerce, but also to *commerce generated by malnutrition*. This, in essence, is the core argument of this chapter – not only that various types of commerce contribute to hunger in the world, but that hunger provides an opportunity for global commerce. Commerciogenic malnutrition, in this sense, refers to malnutrition as a something that *produces* commerce, *enables* commerce. To put it simply, malnutrition has become part of the food business.

There are two main ways in which malnutrition generates commerce. At the micro-level, food manufacturers develop specific emergency foods, developing proprietary 'treatments' for starvation. These may take the form of emergency biscuits, therapeutic milks, or products that originally had other uses, which were taken up by humanitarians and transferred to new uses. In the first half of this chapter I look at the commercial history of famine foods, tracing these specific commercial opportunities. But malnutrition also generates commerce at the macro-level. In a more structural sense, emergency foods have forged a place in our globalised system of food production. A good example is CSB, or Corn-Soy Blend, which is made from the two main surplus commodities of the United States: maize and soya. Here, malnutrition generates a use for agricultural surpluses, and in the second half of this chapter I explore this phenomenon, showing how emergency foods fit into a modern, globalized world of agriculture, characterised by monoculture and massive outputs.

In drawing attention to these connections between malnutrition and commerce, this chapter suggests that the market has shaped contemporary relief. To take the example of CSB once again, its form has been shaped not just by its importance in disaster, but also by its utility to agricultural interests. The reason we

distribute CSB, in other words, is not simply because it is nutritionally balanced, but because it is a nutritionally balanced blend of agricultural surpluses. Its existence is a result of a particular historical arrangement: the post-war emergence of a 'productivist' food system, which featured strong state support for farming and green revolution technologies. Productivist agriculture began in the early 1930s and came into its own after the Second World War, resulting in a massive increase in yields. It saw the United States become the breadbasket of the world, with huge surpluses in numerous commodities. The productivist food system rationalised farming methods, producing massive amounts of just a few high yielding crops, which became linked to an expanding food industry that would process, break down and 'add value' to these crops. In the second part of this chapter, I argue that this agricultural regime was particularly influential in shaping humanitarian nutrition. To put the chapter's argument succinctly: malnutrition generates commerce, and commerce has shaped the character of humanitarian relief.

The micro-level: promoting food from residue

We start, however, at the micro-level, looking at specific famine foods. These have a long history, beginning with Justus Liebig – scientist, biochemist, and the founder of nutritional science. Liebig was not just a ground breaking scholar, but also a canny entrepreneur; very early on, he realised that the science of nutrition could be used to promote certain products, such as his own 'Extract of Meat', which came onto the market in 1865. This was a thick brown liquid, created by boiling pressed slabs of cow flesh in South American factories, where beef was particularly cheap. The bottles were then shipped across the oceans, and reconstituted as beef tea or as an additive to other foods. Each bottle carried Liebig's 'seal of approval', a guarantee of quality and

a scientific justification for its use. Liebig argued that his food was particularly good for the ill and infirm, since it offered a cheap and easily digestible form of meat – in soluble form – which, he stressed, was particularly useful for rebuilding the strength and getting nitrogen to the muscles.[10]

Liebig's extract of meat was the first example of a widely promoted food for the weak and the malnourished. Through aggressive marketing and advertising, the product was promoted through pharmacies and medical publications. Beef tea was already a common food for convalescents, but Liebig had made it portable and convenient; the adverts claimed that forty pounds of the best lean beef went into making every pound of meat extract, with the implication that the latter contained all the goodness of the former. This was certainly untrue, but many people accepted the product as a medicine; Florence Nightingale, for one, was certainly taken in by the idea, praising Liebig's product and recommending such beef tea in her handbook 'Notes on Nursing'.[11] Liebig has also been credited with inventing Marmite. Like his extract of meat, this was a bottled, thick brown paste, but this time made from brewer's yeast. It was not manufactured by the Liebig company, but was promoted on similar grounds: as a restorative, alternative to beef tea, and later as a source of nutrients and rich in B vitamins. In addition to appearing on the British breakfast table, it was used in treatments for anaemia, and it later appeared in the diets Cicely Williams recommended to sufferers of kwashiorkor in the Gold Coast.[12] If it seems

[10] It turned out there was no evidence to support such claims. See Finlay, 'Early marketing of the theory of nutrition'; William Brock, *Justus von Liebig: the chemical gatekeeper* (Cambridge: Cambridge University Press, 1997), 115-45; Layinka Swinburne, 'Von Liebig Condensed', in *Cooks and other people: proceedings of the Oxford Symposium on Food and Cookery 1995*, ed. Harlan Walker, (Totnes: Prospect Books, 1996); Scrinis, *Nutritionism: the science and politics of dietary advice*, 53-7; Carpenter, *Protein and energy*, 74-76. Bovril and Oxo cubes are contemporary versions of Liebig's Extract of Meat.

[11] Nightingale, *Notes on nursing*, 36-42, 59; Finlay, 'Early marketing of the theory of nutrition', 59, note 55; Beverly Calkins, 'Florence Nightingale: on feeding an army', *The American Journal of Clinical Nutrition* 50, no. 6 (1989).

[12] See previous chapter. For other uses of marmite as a health tonic, see Frances Rachel Frankenburg, *Vitamin discoveries and disasters: history, science, and controversies* (Oxford: Praeger, 2009), 57-8. Its promotion as an alternative to beef tea is evident in several papers, including Arthur Gamgee, 'Are Yeast Extracts Justifiable As Substitutes For Extract Of Meat?', *The British Medical Journal* 2, no.

rather strange that Marmite, that salty, savoury powerfully tasting syrup, should become part of a treatment for kwashiorkor, it was only because, like extract of meat, it had already lodged in the tastes and minds of Western doctors through the power of advertising. Just because they were humanitarians, one cannot expect physicians like Cicely Williams to stay immune to the promotions and health claims of major products.

Jelliffe's paper, 'commerciogenic malnutrition', noted this age-old problem. 'Too frequently', he wrote, 'one found the paediatrician in a tropical, sun-drenched country, exhorting mothers to use cod liver oil to prevent non-existent rickets. Or, one found the public health nurse from Europe advising mothers to feed their babies on orange juice when infantile scurvy did not exist'.[13] These were products recommended in distant training courses, adopted as a result of promotion back home. Indeed, there were a number of products doing the rounds in the 1930s and 1940s, which had become part and parcel of medical practice in the West, often promoted through advertising to doctors. Desiccated Hog's stomach, for example, came as proprietary formulae such as Ventriculin or Extomak. 'Tonic foods' such as Bemax and Benger's Food were also trialled for the malnourished. Casilan was widely advertised in medical publications as a good way to get protein into the diet, and when protein hydrolysates emerged in the 1940s, Mead Johnson manufactured them for profit. Even now, the Mead Johnson website promotes their 1940s protein hydrolysates as an example of their proud history, describing Amigen as 'the first life-sustaining intravenous solution for nutrition'.[14]

With the exception of Amigen, these were not specific starvation treatments, promoted for profit and marketed to aid agencies. Humanitarians were taking certain

2486 (1908). For a background to Marmite and its context in the history of vegetarianism, see Jan Marsh, *Back to the land: the pastoral impulse in England, from 1880 to 1914* (London: Quartet Books, 1982), 187-204.

[13] Jelliffe, 'Commerciogenic Malnutrition?', 199.

[14] http://www.meadjohnson.com/company/pages/our-history.aspx accessed 5th November 2013

products from what were commercially available, influenced by their medical claims. Until the 1960s, humanitarian agencies were still rather small, so there was only a very small market for specific starvation foods, that is, foods designed to treat malnourishment. What we find initially, therefore, is improvisation: foods that were marketed more generally for the sick, the infirm, the weak, as well as more specific pharmaceuticals like Casilan and Ventriculin, adopted and adapted for other uses. At least at first, this shows a limited influence of commercialism on starvation treatments, but it also demonstrated its considerable potential. As hunger became a more clearly articulated global problem after the Second World War, especially with the establishment of kwashiorkor as the 'most serious and widespread nutritional disorder known to nutritional and medical science', high protein foods and Fortified Blended Flours began to offer a more targeted response – and an opportunity for commerce.[15]

Food from residue

These foods were often made from cheap, readily available surpluses, from the residue of other commercial processes. They sought to cut costs by finding the cheapest source of protein, and transforming it into a new food. Incaparina, for example, was based on the protein from cottonseeds – a cheap residue from the cotton industry, and one of the USA's biggest surplus products. K-Mix was based on dried skim milk (DSM) – a cheap residue of the dairy industry, the preserved remainder after milk had been made into butter and cream. Corn-Soy Milk (CSM) was manufactured from the three largest American agricultural surpluses. Even the foods that never made it into large-scale production were based on residues. Single Cell

[15] J. F. Brock and M. Autret, *Kwashiorkor in Africa* (Geneva: World Health Organization, 1952).

Protein emerged as a by-product of oil refinement. Algae were grown on sewage. Fish Protein Concentrate was produced from junk fish – scales, fins, viscera and all. Even Leaf Protein Concentrate, the more bottom-up and palatable of these new foods, was based on the idea of gaining food from cheap and widely available green leaves – plants that were largely ignored and that could be transformed into a nutritious meal with the help of science. There were also proposals to grow proteins on waste wood, which would be 'heated and treated with acid to convert the cellulose in the wood into sugar'.[16]

The idea seemed to be that poor people could be fed on the leftovers of industrial and agricultural processes. This was food from waste, destined for the poor, who had no power to object. There is something almost Dickensian in the implications here. In DSM, you have the poor fed on the leftovers of luxurious cream and butter. In cottonseed, you have the poor fed on a by-product that came from clothing the rich. In Single Cell Proteins, you have food as an afterthought from refining petrol for the cars and aeroplanes of the wealthy. In the last chapter, I argued that these high modernist foods had a paucity of vision, offering little more than fortified gruels: a slightly enhanced version of an already-awful diet. But they also offered a paucity of resources for people who needed it most, offering meagre products from wastes and residues, whilst drawing from, rather than challenging, unequal economic structures: fortifying these diets with the disposed products of mid-century Western opulence.

[16] Murray, 'A nice, tasty wooden steak'. See the previous chapter for a background to these products and their manufacturing processes.

Selling to the poor

There was also a commercial mentality in the way these products were promoted. Unsurprisingly, many poor people were reluctant to eat such unpleasant foods, but their reluctance was dismissed as tradition, backwardness, and an obstacle to progress. The modernisers sought to convince people of their value, to harness the forces of 'nutritional persuasion' and modern techniques of advertising.[17] 'If the people will not eat a green food, we must bring up a group who will!' Pirie had declared in 1958.[18] It was an attitude shared by aid staff. There is always 'resistance to change', wrote one manager of the World Food Programme in reference to fortified flours a decade later, especially 'when one is endeavouring to introduce new or unfamiliar foods to a wide range of people around the world'. 'It is important to overcome these difficulties by education,' he continued, suggesting that 'simple illustrated literature in the right language', 'practical advice and demonstrations', coupled with 'a reasonable element of persuasion' was the best approach.[19] An aid worker from CARE echoed this sentiment in the same conference: 'cereal foods blended with soy is a new idea', she said, 'and primitive or traditional societies are unreceptive to anything which is new or different'. She then quoted 'an old proverb' that 'wisely says, "what little farmer don't know, little farmer won't eat"'. This patronising sentiment suggested malnutrition was caused by the poor's own fear and bloody-mindedness, which could be manipulated by the right advertising techniques.[20]

[17] Jelliffe, 'Commerciogenic Malnutrition?', 200.
[18] Pirie, 'World hunger as a biochemical problem', 526.
[19] George Hutton, 'International programs utilizing soy foods: the world food program', *Journal of the American Oil Chemists' Society* 51(1974): 146.
[20] Margot Higgins, 'Soy products in national and international programs: field and emergency programs', *Journal of the American Oil Chemists' Society* 51(1974): 143. This echoes a much wider discourse of post-war development interventions, which was all about development communications and undermining tradition through propaganda. For an interesting example, see Daniel Lerner, *The passing of traditional society: modernizing the Middle East* (New York: The Free Press, 1964).

A particularly good example of these techniques can be found in the Christian Aid-funded leaf protein programme in Nigeria. In this project, much thought was put into the promotion and presentation of the leaf protein powder. It was obvious that if people did not eat the protein, the project had no purpose, so the committee sought ways to make it more attractive, to get over local suspicions. They planned to present the powder in cellophane bags, with a bold, bright label. They distributed the food through hospitals, associating it with health, as a kind of medicine. They thought carefully about its name. After rejecting some proposals – such as 'Agunmu' – on the basis of their 'unfortunate local associations' (this was a word for a traditional medicine, which did not match the modern, technologically advanced self-image of the project), they decided on 'Sokotein', a portmanteau of 'protein' and 'soko', which was one of the plants used in production of the concentrate.[21] They also drafted posters to display in hospitals and government clinics, suggesting that LPC would allow the 'normal, healthy growth of post-weaning children', that they would make children 'strong'. The promotional techniques tried to ease fears about the unusual powder, declaring it was 'the concentrated goodness of the leaves that you like', based on plants that 'grow all around you'.[22]

This choice of messages, imagery, distribution and naming was no accident: they were based on the marketing techniques of infant food manufacturers in Nigeria, something explicitly acknowledged by the project committee. Their aim, said one member with no awareness of the upcoming baby milk scandal, was to come up with a name that would become as recognised as 'Cow and Gate'. To do this, they considered calling the leaf protein 'Milki Dudu' (black milk), hoping that its dark

[21] 'Posho Mill project for the production of leaf protein', advisory committee minutes from 22nd June 1973, Christian Aid archives, SOAS special collections, London, file CA4/A/2/10, page 3. The name Sokotein appears to have been agreed upon by the late 1970s. 'The construction of a processing unit for the production of dried leaf protein concentrate', by Peter Fellows, c.1977, CA4/A/3/1.
[22] 'The construction of a processing unit for the production of dried leaf protein concentrate', appendix 2, Peter Fellows, c.1977, CA4/A/3/1.

green powder might be associated with the white powder of dried milk. They promoted it through clinics and government hospitals, drawing on the authority of healthcare and the power of advertising. They pushed similar messages: that leaf protein would promote healthy growth, make you strong, and that it was a natural alternative to common foods.[23] Baby milk manufacturers (like Cow and Gate) were using exactly these messages in 1970s Nigeria, promoting their milk through hospitals, claiming it would help babies 'thrive from the very first bottle', and suggesting it would restore their 'strength, energy and power'.[24] In this historical irony, the project committee were trying to replicate the positive associations of a very destructive set of practices, on the basis that people's backwardness could be overcome through modern marketing techniques.[25]

But there was another irony, too, because Leaf Protein Concentrate was an entirely unnecessary product. It was complicated to manufacture, difficult to promote, and expensive to produce. In the Nigerian example, Christian Aid spent nearly seven years supporting its development, spending tens of thousands of pounds a year on the project, and seeing little progress during a decade of involvement. The leaf protein was never really suitable; its problems were manifold. The original plan was to use local resources and expertise, processing the leaves through an existing network of 'Posho Mills', which were used to grind corn, cassava and other staples. But these mills had the wrong kind of mechanism, and so the leaf protein machinery had to be imported, adapted and maintained by an expatriate food technologist. Even then, the final product ended up with an 'unappetising green colour', a powder that was 'gritty', tasting 'a bit like pond weed', and, most worryingly, one that made faeces

[23] 'Posho Mill project for the production of leaf protein', advisory committee minutes from 15th September 1973, file CA4/A/2/10, page 3.
[24] Muller, 'The baby killer', 10.
[25] The techniques used to promote LPC were similar in a great many fortified flours. For a summary, see Orr, *The use of protein-rich foods for the relief of malnutrition*, 38-42.

green, which scared the mothers who were asked to feed it to their children.[26] By 1979, the project was looking untenable: machines were broken and left to rust, crops were untended and going to seed, financial irregularities were noticed in reports, and the whole concept was being questioned. Perhaps the most damning critique came from a scientist at the University of Ife, who had been involved in the early stages of the project. In the minutes of a meeting from the early 1980s, he declared that LPC never had any advantage over other sources of protein, and that local people 'might as well just grow a few more beans.'[27]

Indeed, this was one of the biggest problems with these fortified flours and high protein foods: they offered no real advantage over beans, pulses, and lentils. Traditional sources of protein could sustain people more cheaply and effectively than modern inventions; the solution, therefore, came back to marketing: presenting the high protein foods as progressive and superior, making them aspirational, not 'poor man's foods'. Many fortified flours, such as Incaparina, were marketed to a wide section of society. They were intended for use by the whole family, not just by the infant; by the middle classes, not just by the poor. This was reflected in their advertising, which featured pale-skinned, well-dressed, widely smiling people. As we saw in the last chapter, Bill Pirie spent some time making leaf protein into a more 'high end' food, devising cocktail snacks for embassy receptions. In a similar way, Multi-Purpose Food was served at the inaugural meeting of the United Nations, and aid workers collected recipes in order to demonstrate the diverse dishes that could be made with other fortified flours, including 'puddings, dumplings, fritters and a variety

[26] Leaf Protein Project, minutes of advisory committee, 26 November 1977, file CA4/A/1; 'Posho Mill project for the production of leaf protein', advisory committee minutes, 22nd June 1973, file CA4/A/2/10. 'Preliminary report of the leaf protein acceptability trials', by Peter Fellows, July 1977, file CA4/A/3/1; interview with Bridget Walker, 7 January 2011; interview with Peter Fellows, 11 January 2011.

[27] Memo from Justin Phipps to Sarah Hughes, concerning conversations with Professor G. Howat (formerly Dean of Technology at the University of Ife), 24th November 1980, file CA4/A/2/12.

of bakery items, even some confections closely resembling candy'.[28] The aim, he said, was to generate acceptance at the higher levels of society, making leaf protein an attractive ingredient across the social spectrum, and generating its uptake amongst the poor.

The drive to make fortified flours an aspirational product led to an amusing, if marginal scheme, which was described light heartedly in the *Guardian* newspaper in 1971. Investigating something called the 'Cauldron Club' in Wales, the authors found a well-intentioned humanitarian scheme to devise new dishes, which would be made from synthetic foods. A group of enthusiastic housewives in Portmeirion were requesting new flours and protein substitutes from British manufacturers, and then inventing recipes that showcased the ingredients. Their dishes used the technical names given by the manufacturers, which led to concoctions such as '354/B9 Chasseur', and '86-Q a la King'. 'We have to aim for the top end of the market' said one of the housewives. No one wants to eat poor people's food; 'we want to eat what rich people eat'. The idea was to make new foods attractive to wealthy consumers, in the hope that they would become more acceptable to the poor. 'We shall spread these marvellous recipes', a club member pronounced, 'and hope that wealthy people in the developing countries will say 'this is jolly nice stuff'. If they do, then everybody will want to eat it.'[29]

Despite these efforts, from the serious to the ridiculous, high-protein foods would never become part of the poor's weekly shopping because the production process was too complex and the final cost was always greater than planting beans. The lengthy process for making Incaparina, for example, involved four plants – maize, sorghum, cottonseed, and kikuyu grass – separately boiled in calcium

[28] Higgins, 'Soy products in national and international programs: field and emergency programs', 144.
[29] Simon Hoggart, 'Dining out? Try some 354/B9', *The Guardian*, May 4 1971. This is obviously a small and insignificant scheme, written up in the 'and finally…' style of a lightweight human interest story, yet it still captures the mood of the time – that by making new protein sources attractive to the elite, they might be more easily marketed to the poor.

hydroxide, ground, dried, prepared into flours, mixed, fortified, dried and flaked.[30] With so many procedures involved, it was unlikely this could be cheaper than a traditional peasant diet: indeed, Incaparina was always more expensive than corn, to which it was conceived as an alternative.[31] The upshot was that the poorest people could not afford to buy these foods. Unless a government or international agency subsidised them, they were too expensive. The commercial mind-set assumed people could buy their way out of malnutrition by making careful consumption decisions. They could not. If they had the disposable income to buy these flours, they would not be malnourished in the first place.

The most successful schemes recognised this. They understood that people could not buy their way out of malnourishment, since they were malnourished precisely because they were poor. They distributed fortified flours for free, or at a highly subsidised price, drawing on government support and funding from international philanthropic institutions. Most of the examples featured in the previous chapter fell into this category, including Bal-Ahar in India, Faffa in Ethiopia, Superamine in Algeria, and Incaparina in Guatemala. These were state-led, internationally financed initiatives, framed as an opportunity to develop industry and modernise society. All the same, a significant number of schemes tried to *sell* the flours, to create a market for them. Their aim was to use the market mechanism to facilitate distribution. They subsidised, supported or contracted corporations to produce the flours, often providing recipes that had been pre-agreed or developed by research institutes. They then ensured that the flours were distributed to small local shops and promoted them to the poor, expecting this to lead to their rapid uptake.

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[30] 'Progress report on development of Vegetable Mixtures 9 and 10', written for INCAP donors, dated September 1958, Archives of the London School of Hygiene and Tropical Medicine, Nutrition/18/20/04, pages 2-6.

[31] Incaparina was considered to be a substitute for *atole*, a corn-based drink, to which its price was very unfavourable. But its nutritional balance was meant to be similar to milk, against which it was priced far more favourably. In any case, it was more expensive than existing peasant diets.

In 1972, Britain's Overseas Development Administration estimated that over seventy per cent of the high-protein flours and emergency foods were commercial operations.[32] Many of these were publicly subsidised, privately manufactured products, which involved large food corporations. Peruvita, for example, was made by Nestle with support from the Peruvian government and FAO. Arlac was made by Unigate (a large British dairy company), supported by Unicef and the government in Northern Nigeria. In addition, there were a number of exclusively commercial operations. Coca-Cola, for example, produced a high-protein drink called Saci in Brazil. Glaxo manufactured a peanut-based food called Amama in Nigeria. General Mills produced a soy-based flour called Protea in Mexico.[33] These were modelled on existing high-protein products, such as Incaparina and Multi-Purpose Food. The food companies and the public sector had both identified a commercial opportunity: to extract cheap protein from residues, and then market them as a high-protein food, capitalising on the narrative of a global 'protein gap'.

Very few of these schemes, however, benefitted the poorest and most malnourished. In the technical language of one 1970s report, 'most of the protein-rich food projects have failed to improve the nutritional situation of the neediest groups because of the very low purchasing power of the target group'.[34] The ODA report concurred: 'without subsidies, the new foods could not compete with staples'.[35] To put this another way, malnourished people could not afford protein flours. In the end, those flours that sold well did so by appealing to a general market – sometimes with real commercial success. Pronutro, for example, began as a soya and maize weaning food for the black urban poor in 1940s South Africa, but was then re-launched for the

[32] Orr, *The use of protein-rich foods for the relief of malnutrition*, 34.
[33] Elizabeth Orr, 'The contribution of new food mixtures to the relief of malnutrition: a second look', *Food and Nutrition Quarterly* 3, no. 2 (1977): 4-10; *The use of protein-rich foods for the relief of malnutrition*, 7-32; Carpenter, *Protein and energy*, 172-5.
[34] Jensen, 'Protein-Calorie Malnutrition and industrially processed weaning foods', 232.
[35] Orr, *The use of protein-rich foods for the relief of malnutrition*, 4. For another, similar, evaluation of these foods, see DeMaeyer, 'Processed weaning foods'.

white market as an aspirational product, ending up as a popular breakfast cereal in South Africa.[36] Vitasoy had a similar story. It was conceived in the 1940s as a cheap soy-based substitute for milk, targeted at malnourished Chinese refugees in Hong Kong, but it later became a commercial product, marketed at the general consumer, and it is now a popular beverage.[37]

The commercial possibilities of high protein foods meant the more successful publicly funded programmes were sold off. Thriposha, originally established in 1972 for public-sector feeding programmes, was privatised and re-launched in 1980 as a commercial product, distributed by Lever brothers.[38] Faffa, established in 1967 by the Ethiopian Nutrition Institute, became a private food company.[39] Incaparina was always manufactured by the private sector, but it became successful more as a general grocery than a weaning food. The longevity of these products was down to marketing. Their success has nothing to do with being miracle solutions to malnourishment, or for being impeccably nutritionally balanced; they survived not because of their origins in humanitarianism, but in spite of them. They grew because they were able to appeal beyond the non-existent market of the poor, because they were able to convince middle-class consumers that they were useful and worth the extra cost, and because they managed to become a regular feature of the national diet.

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[36] HJH De Muelenaere, 'Development, production and marketing of high-protein foods', in *Protein-enriched cereal foods for world needs*, ed. Max Milner, (St. Paul: American Association of Cereal Chemists, 1969); Carpenter, *Protein and energy*, 172-3; Orr, *The use of protein-rich foods for the relief of malnutrition*, 24.

[37] Vitasoy has now become the name of a successful food company. For some history, see *The use of protein-rich foods for the relief of malnutrition*, 15; William Shurtleff and Akiko Aoyagi, *Soymilk industry and market: worldwide and country by country analysis* (Lafayette: Soyfoods Center, 1984). 'Obituary: Dr. Kwee Seong Lo', *Transactions of the Oriental Ceramic Society* 58 (1994).

[38] Hornstein, "Thriposha: product and program."; Robert Porter and Lonna Shafritz, "Packaged foods for complementary feeding: marketing challenges and opportunities," (Washington, D.C.: Center for Nutrition LINKAGES project, 1999), 30.

[39] Abraham Besrat, 'Protein quality of Faffa, the Ethiopian infant formula', *Journal of Food Biochemistry* 5, no. 3 (1981); Hofvander, 'North–South collaboration: a success story', 323. Hofvander's fuller report on Faffa is available online at http://www.oxfordjournals.org/our_journals/tropej/online/.

This story is consistent with the wider food market. To grow, food companies rely on the power of advertising, nutritional claims, and relentless innovation. They do this to tackle the 'fixed stomach' – the inelastic demand for food. Food sales are famously unresponsive to price and income: if we earn more money, or if food becomes cheaper, we do not necessarily buy more of it. Indeed, we only buy as much as we can eat, which remains relatively constant – there is only so much food our stomachs can take. So if food corporations want to make more money from food, they must 'add value'. They must find ways to charge more for the limited amount we buy. Common techniques include processing, fortifying, adding new health claims, and promoting foods to a specific target group. This allows them to charge more, per calorie, than they would receive for the whole foods, the traditional commodities.[40]

Commercial successes like Pronutro and Incaparina relied on this template. They targeted mothers, and were based on health claims. They were made from residues, and they were highly processed. The same techniques have, amazingly, been used to promote the more unusual sources of modernist protein. Food based on algae is still marketed to the gullible for its 'health benefits'.[41] Casilan and other protein hydrolysates are promoted to body-builders.[42] Many people have eaten Single Cell Proteins without even realising: Quorn, the popular meat substitute for vegetarians, is a single cell protein based on the research begun by BP in the 1950s.[43] These are all evidence of the relentless power of the food industry to promote unnecessary products in the hope of extracting profit from niche markets.

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[40] Perhaps the best explanation of this phenomenon can be found in the popular book Michael Pollan, *The omnivore's dilemma: the search for a perfect meal in a fast-food world* (London: Bloomsbury, 2006).

[41] Chlorella powder can still be found in health food shops, with some brands certified as organic and marketed to vegans. Whether or not that means they are grown on sewage is anyone's guess. *Organic Chlorella Powder*, manufactured by Rainforest Foods, widely available.

[42] Again, Casilan is still in production, but rather than being marketed to doctors, it is now stocked in health food shops to be sprinkled on your cereal as a 'muscle builder', complete with a cover image of a ripped young man. *Casilan 90*, manufactured by Complan Foods Limited, widely available.

[43] Quorn, it should be said, may be a Single Cell Protein, but it is not grown on oil. Manufactured by Marlow Foods, widely available.

Selling to aid agencies

Of course, these 'success' stories all relied on a richer, middle class market: there was no profit from selling fortified flours to the poor. But companies could still market their emergency foods to humanitarian agencies. Indeed, documents from the 1960s and early 1970s show how much private companies were offering free samples, suggestions, and proposals for collaboration. Christian Aid, for example, was offered several hundredweight of 'Strong Arm' biscuits by the United Biscuit Company, manufacturer of well-known British brands such as McVitie's, Jacobs, and Carr's.[44] The biscuits were described as 'a new inexpensive source of high quality protein', and they were made from 40% fishmeal – an ingredient that is produced from the offal, organs, skin, and small bones of fish.[45] Nowadays, fishmeal is used for animal feed and dog biscuits, but in the 1960s, the Strong Arm company could recommend eating at least three fishmeal biscuits per day to help meet the protein requirements set by the Food and Agricultural Organisation.[46] They could also describe the main ingredient of these biscuits as 'fillet house by-products from white fish of the North Sea' – a rather florid and disingenuous description of offal.[47] According to a Christian Aid director, the biscuits did taste 'somewhat fishy', but this did not stop them purchasing them for a feeding programme in Taiwan.[48] Here, again, was food from residue, marketed to

[44] Letter from Arnold Bender, John Atkins Laboratories, to Janet Lacey, Christian Aid, 14th September 1967, Christian Aid archives, file CA/C/13.
[45] Promotional leaflet for Strongarm biscuits, c. 1967, Christian Aid archives, file CA/C/13. 'Strong Arm – High Protein Food: General Description', c. 1968, Christian Aid archives, CA/C/13.
[46] Promotional leaflet for Strongarm biscuits, c. 1967, Christian Aid archives, CA/C/13.
[47] 'Laboratory reports from the Ministry of Technology - Torry Research Station and the Central Institute for Nutrition and Food Research', Christian Aid archives, CA/C/13. 'Strong Arm – High Protein Food: General Description' document, c. 1968, Christian Aid archives, CA/C/13.
[48] Letter from B. J Dudbridge, deputy director, Christian Aid, to Helmut Reuschle, Inter-Church Aid in Switzerland, 24th March 1969, Christian Aid archives, CA/C/13. Around a ton was purchased for a feeding programme in Taiwan. Correspondence between Janet Lacey, Christian Aid, and Jeanny Chen, Taiwan Christian Service, late 1969 and early 1970, Christian Aid archives, CA/C/13.

aid agencies as a 'cheap source of protein', its price compared favourably to eggs, beef, and fresh milk.

The price was emphatically not, however, compared to lentils and beans, which remained the main source of protein in the Third World. If it had been, perhaps Christian Aid would not have purchased so many Strong Arm biscuits. Beans remained a good deal cheaper than fortified flours and biscuits, but they lacked the modernist appeal – something to which aid agencies were susceptible. Christian Aid was certainly not alone in this: many organisations were targeted for high-protein foods. The World Council of Churches, for example, confirmed that their partners received similar promotions across the world, and Oxfam were approached by several companies interested in Single Cell Proteins and fortified cereal flours.[49] In the latter case, a firm called 'World Traders and Investments' offered Oxfam a number of new protein extracts in the early 1960s, including 'Polymine S' made from sesame, 'Polymine M' from soya, and 'Nutrimine C', from cottonseed. There were shades of Soylent Green in these names, but the letter was careful to emphasise that all products had been tested and were free of toxins (this was important because raw soybeans contain high amounts of lectins, and cottonseed contains gossypol, both of which can be poisonous). The company was especially keen to push cottonseed flour, which, the letter stressed, was of particular interest to governments 'where mass nutrition is still a major problem'.[50]

Oxfam did not respond to this particular promotion, but it took the rare step of entering directly into a commercial venture. In the middle of 1966, it received an offer

[49] Letter from Charles Arbuthnot, deputy director of the WCC to Janet Lacey, Christian Aid, 17th October 1967, Christian Aid archives, CA/C/13. R. M. Belbin, 'Notes on a project to develop a Bacterial Protein Food' and associated correspondence, 3 April 1963. Oxfam archives, file DIR/2/3/2/57.

[50] Letter from Patrick Cooney, president of World Traders and Investments to the Director General of Oxfam, December 30th 1963, Oxfam archives, file DIR/2/3/2/57. Citing dramatic and curiously rounded figures, they claimed that '1,000,000 tons of cotton meal in India could be used to produce 333,333 tons of high quality protein isolate'.

to become an investor and shareholder of a new company in East Africa, which would produce a high-protein product called Supro. This was already being manufactured in London and South Africa, and Oxfam had been purchasing considerable amounts – mainly for their school feeding programmes in Kenya.[51] By establishing a new company in Nairobi, Oxfam believed that they could buy Supro more cheaply, since it would be made from local materials and Oxfam could have it at cost price; their enthusiasm for the product should also be read in conjunction with the wider interest in high-protein flours and modernist products, which existed at the very highest levels in Oxfam during this period.[52] In the minds of the Oxfam aid workers, Supro promised a cheaper, more effective food for a large childhood nutrition programme, which they had just begun running for the Kenyan government. Although they had never previously been involved in any commercial undertakings, the charity was keen to 'benefit from what appears to be a very viable venture allied to Oxfam's aims'.[53] They purchased a third of the shares in the company and took a seat on the board, predicting profits of around £10,000 per year (around £160,000 in today's money).

In the early stages, there was a great deal of optimism, and the Oxfam board were told that 'many others are only too keen to invest in a company with such rosy prospects'.[54] But very quickly, the investment became a disaster. The company was incorporated on the 1st January 1967, and by March it was already making large losses. Production was outstripping sales by three to one, and much of the flour was

[51] 'Circular Memorandum to Members of Council: the Supro project in East Africa', September 1966, Oxfam archives, DIR/2/3/2/54. In the previous year, Oxfam had imported around 50 tons of Supro to Kenya for feeding programmes.
[52] See chapter five for more on Oxfam's involvement in modernist foods.
[53] Letter from M.H Rowntree, chairman of the Oxfam executive committee to V. Ezra, Managing director of Supro, 12th September 1966, Oxfam archives, DIR/2/3/2/54; 'Supro: a digest of correspondence and minutes up to 30.6.1967', circular for the Oxfam board. Oxfam archives, DIR/2/3/2/54.
[54] 'Circular Memorandum to Members of Council: the Supro project in East Africa', September 1966, Oxfam archives, DIR/2/3/2/54.

placed in storage, where rats and weevils attacked it.[55] Within four months, the company was seeking more capital, approaching Oxfam for a loan of £25,000 (£400,000 in today's money). This was rejected, although Oxfam did ask its other African programmes to purchase Supro for feeding programmes in order to help support the company.[56] From here, problem piled upon problem. There was an adverse report from scientists at the University of Wisconsin, who detected high ash content in the flour.[57] Another report by the World Food Programme noted that the formula of the flour – 50% maize, 25% yeast, and 15% milk powder plus flavourings – was too heavy on the yeast, causing digestive troubles.[58] Most seriously, the school-feeding programme, which was the main intended outlet for the flour, was beset by personality clashes and inertia, taking time to get started and so failing to purchase as much Supro as had originally been anticipated. [59]

To compensate, the company began promoting Supro to Kenyan prisons, as well as to corporations, large farms, estates and mining compounds. [60] The aim was to shift large quantities of the food, to get rid of deteriorating stockpiles, and start turning a profit. With insufficient demand from school feeding programmes, Oxfam ended up in the curious situation of selling their fortified flours to industrial canteens in the most exploitative Kenyan industries. Their product was probably still ending up on the plates of the destitute (via the low-paid workers of plantations and mines) but

[55] Memo 'Supro, Oxfam and Oxfam Activities ltd.', from T. F Betts, Field Director, to E. Leslie Kirkley, Oxfam Director, dated 18th March 1967. Letter from M. Murimi of Supro Ltd to M. Ronaldson of Oxfam, 19th December 1967. DIR/2/3/2/54.
[56] 'Supro: a digest of correspondence and minutes up to 30.6.1967', page 3. Memo 'Supro, Oxfam and Oxfam Activities ltd.', from T. F Betts, Field Director, to E. Leslie Kirkley, Oxfam Director, dated 18th March 1967.
[57] 'Wisconsin Alumni Research Foundation Laboratories, Assay report on Supro', June 27th 1967, and 'Memorandum to the board of Supro laboratories Kenya limited: tour of Mr. T F Betts to Uganda, Rwanda and Burundi.' January/February 1967. Oxfam archives, DIR/2/3/2/54.
[58] 'Supro: a digest of correspondence and minutes up to 30.6.1967'.
[59] 'Supro, Oxfam and Oxfam Activities ltd.'
[60] Letter from M. Murimi of Supro Ltd to M. Ronaldson of Oxfam, 19th December 1967. Letter entitled 'Supro', from TF Betts, Field Director, to Leslie Kirkley, Oxfam director, 8th October 1967. Memo 'Supro, Oxfam and Oxfam Activities ltd.', from T. F Betts, Field Director, to E. Leslie Kirkley, Oxfam Director, dated 18th March 1967. DIR/2/3/2/54.

by investing in a commercial concern, they were using these groups to generate profit, whilst supporting the institutions that kept workers poor. To make matters worse, this was all taking place without any real evidence that Supro was appropriate or adequate. The situation was so obviously undesirable that the field director wrote many lengthy memos back to headquarters explaining the travails and justifying his decisions.[61]

The really strange part of this story was that the nutritional contribution of Supro was rather poor. The product was being justified on nutritional grounds, but a report from the World Food Programme concluded that its protein contribution was 'negligible'. In a reply, the Oxfam field director pointed out that the Supro was being distributed with beans, with two ounces of beans to every half-ounce of Supro. 'The utilizable protein from the beans is approximately 14 grammes', he wrote, 'which is well above the 12 grammes recommended'. In other words, Oxfam were bulking out the Supro with beans, which were a much cheaper source of protein. Yet they did not seem to be questioning the value of using Supro at all: based on their figures, beans *alone* could have provided the necessary amount of protein, whilst coming in at a third of the price.[62]

After around eighteen months of production, Oxfam withdrew from the venture entirely, accepting the losses and selling all their shares for the nominal price of £5. In explaining Supro's failure, the Oxfam field director partly blamed the arrival of American Corn-Soy Milk, or CSM, which was made available to feeding schemes at virtually no cost. This, he argued, was reducing the potential market for Supro and

[61] There is evidence that Pronutro was also marketed to mining companies in South Africa for mass feeding – see Popkin and Latham, 'The limitations and dangers of commerciogenic nutritious foods', 1016, note 7.

[62] Oxfam's own budget sheet showed that beans were selling at 46 cents per pound, versus a shilling and a half per pound of Supro. Even if they realised the absurdity of adding Supro to a cheaper and perfectly good meal of beans, they were also concerned about the commercial success of the venture. Especially for the field director, defending the programme was the most obvious response. Memo: 'Supro scheme 1968 for Karamoja'. Letter entitled 'Supro', from TF Betts, Field Director, to Leslie Kirkley, Oxfam director, 8th October 1967.

causing the withdrawal of key partners, such as Catholic Relief Services. The director took the threat of CSM so seriously that he enlisted the support of the British high commissioner, complaining of 'competition between our British-evolved and Kenyan-produced product, Supro, and the American CSM'.[63] Although it was a bit of an exaggeration to blame CSM – the Supro project had numerous weaknesses and it was far too expensive – the arrival of CSM certainly caused an upset. It was also an important moment for humanitarianism more broadly, not simply because it upset the market for other famine foods, but because it shows how famine foods had become so integrated into the globalised systems of agricultural production and its export to overseas markets.

The macro-level: the global food system

Looking at CSM in more detail can help illustrate the next stage of my argument: that malnutrition did not just offer commercial opportunities at the micro-level, through the promotion of particular products by companies, but also at the macro-level, tying into the whole 'productivist' system of agriculture which dominated the agricultural economy of America, the world's breadbasket in the middle of the twentieth century. Corn-Soy Milk was being shipped to Kenya as part of the US 'food for peace' programme, which began in 1954, and was instigated for a number of reasons, many of which had little to do with humanitarianism. This programme was partly designed to help American farmers: by finding an outlet for agricultural surpluses, it kept domestic food prices high, as well as guaranteeing a minimum price for key commodities.[64] It was also designed to facilitate American

[63] 'Memorandum to the board of Supro laboratories Kenya limited: tour of Mr. T F Betts to Uganda, Rwanda and Burundi.' January/February 1967. Oxfam archives, DIR/2/3/2/54

[64] It is widely acknowledged that the food for peace legislation served the interests of US agriculture; indeed, the American Farm Bureau Federation (AFBF) was instrumental in getting the original 1954 act through congress. D. John Shaw and Edward J. Clay, *World food aid: experiences of recipients &*

strategic interests: by proving cheap food, the US government was able to create ties with friendly countries, keeping them outside the Soviet sphere of influence.[65] It was intended to create new markets for US agricultural commodities: by flooding overseas countries with cheap corn and soya, consumers and food manufacturers would become reliant on US crops. Only in addition to these motivations was there a humanitarian rationale for the programme, which would offer the agricultural surpluses cheaply, or free, to poor countries and aid agencies. The beauty of the 'food for peace' programme, at least for its proponents, was that it could meet all these objectives at once. With its massive surpluses, America could stabilise agriculture at home, keep friends close abroad, find new market for American exports, and feed the hungry, claiming the moral high ground in the process.

The roots of the 'food for peace' legislation lie in the 1930s, when, during the great depression, the US government implemented a highly interventionist scheme to subsidise farms and stabilise prices. Part of this policy involved the government paying farmers to idle their land. When famers produced too much food, and prices began to fall, the government would pay to leave land fallow, so that prices would go back up the next season. The other part of the policy involved buying excess output, committing to purchase all crops when they fell below a certain price. This had the dual effect of guaranteeing a minimum price for the farmers and stockpiling food, which could be released in leaner years to prevent high prices hurting consumers. The two bodies that implemented these policies were the Agricultural Adjustment Administration (AAA) and the Commodity Credit Corporation (CCC). Together, they oversaw a steady growth in the US farming sector, which was assisted by new labour-

donors (London: James Currey, 1993), 221; Hans Singer, Anthony Jennings, and John Wood, *Food aid: the challenge and the opportunity* (Oxford: Clarendon Press, 1987), 22-23.

[65] Richard Ball and Christopher Johnson, 'Political, Economic, and Humanitarian Motivations for PL 480 Food Aid: Evidence from Africa', *Economic Development and Cultural Change* 44, no. 3 (1996): 516; Jennifer Clapp, *Hunger in the balance: the new politics of international food aid* (Ithaca: Cornell University Press, 2012), 18; Ruttan, 'The politics of U.S. Food Aid policy: a historical review'.

saving machinery and hybrid crops. Most importantly, these institutions created an incentive structure that rewarded overproduction. Since farmers were guaranteed a certain price for their produce, the rational thing to do was to produce as much as possible.[66]

By the late 1940s, this overproduction had become a recurring problem, and stockpiling was no longer a viable solution. A new outlet was sought for the commodities, and Public Law 480 was passed in 1954. It was only later known as 'food for peace' (the term was coined by President Kennedy in 1961), but its passing saw the final element of the 'productivist' food system fall into place, which had an impact not just on America, but also on the world. Networks of food production and consumption were becoming globalised, with more and more people relying in their diets on a limited number of crops, which had been farmed thousands of miles away. By the 1950s, the world food supply had become dominated by American farms, which produced massive surpluses and were becoming dependent on exports, and these farms were organised on increasingly corporate lines, wedded to Fordist production and specialising in a limited number of commodities, such as rice, wheat, corn, and soy. The farms were also tied to a wider sphere of agri-business, which sought to 'add value' to these crops by breaking them down into a variety of derivatives, each of which could be manipulated and rearranged, becoming cheap input commodities for processed food.[67]

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[66] Paul Roberts, *The end of food* (Boston: Houghton Mifflin, 2008), 117; Shaw and Clay, *World food aid: experiences of recipients & donors*, 221; Clapp, *Hunger in the balance: the new politics of international food aid*, 15-21; Mitchel B. Wallerstein, *Food for war - food for peace: United States food aid in a global context* (Cambridge: MIT Press, 1980), 3-17.

[67] The 'value added' is in scare quotes because the value accrued to the producer, not the consumer of these processed foods. For a classic take on the productivist regime and the political economy of food, see Harriet Friedmann and Philip McMichael, 'Agriculture and the state system: the rise and decline of national agricultures, 1870 to the present', *Sociologia Ruralis* 29, no. 2 (1989); David Goodman and Michael Redclift, *Refashioning nature: food, ecology and culture* (London: Routledge, 1991), 87-132. See also Harriet Friedmann, 'Remaking 'traditions': how we eat, what we eat and the changing political economy of food', in *Women working the NAFTA food chain: women, food and globalization*, ed. Deborah Barndt, (Toronto: Sumach Press, 2004); 'The international political economy of food: a global crisis'.

This last feature became a particularly enduring part of the modern food system. Crops like corn and soy remain extremely common, because they form the basis for many other products. Soy, for example, can be processed into soyflour, pressed into oil, converted into milk, transformed into lecithin (an extremely common emulsifier and lubricant for processed foods) as well as becoming the basis for a number of non-dietary products as diverse as biofuels, solvents, insulation, and even candles and crayons. Corn, similarly, can appear in our diets as corn meal, corn starch, corn bran, and high fructose corn syrup, whilst also becoming the basis for a huge range of common ingredients in processed foods, including baking powder, caramel, citric acid, dextrin, malodextrin, xanthan gum, lactic acid, and monosodium glutamate. It has been estimated that 75% of the calories consumed worldwide comes from just four major commodities – wheat, rice, corn and soy.[68] These have not only dominated American farming, but have been broken down, combined and blended to produce a huge number of processed foods, and the act of manufacturing, combining, and packaging the foods has enabled the food industry to receive a much higher price than was ever available from the individual commodities alone.

Fortified flours like CSM were a product of this mid-century productivist regime. They were produced from the main surplus commodities – corn, wheat, milk and soy – which the 'food for peace' legislation was designed to dispose. Perhaps more significantly, they were made from the *derivative* ingredients of these commodities, demonstrating how agriculture had become geared to breaking down these crops into many different parts, extracting maximum value. The 'soy' in CSM is really defatted soy flour, one of the least profitable parts of the crop, which is left after oil has been extracted. The 'milk' in CSM, is really dried skim milk, which is the

[68] Michael J. Roberts and Wolfram Schlenker, 'World Supply and Demand of Food Commodity Calories', *American Journal of Agricultural Economics* 91, no. 5 (2009): 1235; Kenneth G. Cassman, 'Ecological intensification of cereal production systems: yield potential, soil quality, and precision agriculture', *Proceedings of the National Academy of Sciences* 96, no. 11 (1999).

less profitable remainder after cream and milk have been manufactured. CSM, therefore, can be seen as part of the food industry's solution to the 'fixed stomach', which involves packaging and promoting the same commodities to different consumers. Profits can be enhanced by industrial processing, by planting massive amounts of just a few crops, and then refining them, processing them, and rearranging the components into a variety of different foods.

CSM is just one of many ways that the food industry can extract the maximum value from its massive overproduction of a few commodities, and a particularly striking illustration can be found by comparing CSM with the slimming food Metrecal, which was a big dieting fad in 1960s America. Metrecal was an ancestor of the Slim Fast plan, whereby credulous and aspiring dieters drunk a nutritionally balanced 'milkshake' for breakfast and lunch, followed by a normal dinner. Its basic ingredients were dried skim milk, soybean flour and corn oil: the same surplus commodities used in CSM. In Metrecal, the manufacturer (Mead Johnson) had found a way to sell these commodities in a new form, for a new target group – American dieters; in CSM, the millers and food processers had packaged these crops for humanitarian agencies and for USAID, who generally paid for them.[69] What is interesting about this example is that Metrecal used the same ingredients as CSM, but for the opposite purpose. In Metrecal, corn, soy and milk were packaged for losing weight; in CSM, they were packaged for gaining weight. Metrecal was a treatment for overconsumption; CSM was a treatment for famine. The basic similarity of the products, however, led some humanitarian agencies to distribute Metrecal as a famine food: in a letter from Church World Service to Christian Aid, a project manager

[69] Mead Johnson was the same company who made various baby foods as well as Amigen the proprietary protein hydrolysates used after World War Two.

commented that 'one of the best high protein products has been, paradoxically enough, a diet supplement like Metrecal'.[70]

CSM and Metrecal, therefore, were similar foods, but they were marketed for opposite reasons. They demonstrate how value could be extracted from a small number of crops by packaging and promoting them differently. Metrecal, it turned out, was a terrible dieting product – it was even accused of causing deaths, during the 'liquid protein scare' of the late 1970s.[71] CSM, similarly, was not a great famine food: its advantage to the hungry was that it was free, but it was never particularly palatable.[72] But after the 'food for peace' act and the 1966 amendment, which allowed the US government to pay for enriching, fortifying and blending foods, these products played a part in the increasingly globalised food industry.[73] Fortified blended flours, in other words, met the needs of the food industry as well as the biological needs of the starving. It is no accident that the makeup of the foods reflected the commodities in surplus over the middle decades of the twentieth century. Their manufacture fitted into existing patterns of production. Their ingredients used up the least profitable parts of the crops, whilst offering a considerable source of income for the food industry. Indeed, the millers and food manufacturers soon became dependent on

[70] Letter in Christian Aid archives from Melvin Myers (director of the material resources program of Church World Service) to Janet Lacey, Christian Aid, 21st June 1968 - Christian Aid archives, CA/C/13. N.R Kleinfield, 'The ever-fatter business of thinness', *New York Times*, September 7th 1986; June Owen, 'Food news: latest rage for dieters', *New York Times*, September 20th 1960.
[71] N.R Kleinfield, "The Ever-Fatter Business of Thinness," *New York Times*, September 7th 1986.
[72] 'It was very easy to prepare', wrote one aid worker, 'you could mix up a batch of 'finger food' in a dishpan, a cauldron, a bathtub if need be… but unless some sugar or gur (molasses) was added, the children did not find it appetising. I could not blame them. I always ate a sample at every distribution point I visited, and although I simulated enjoyment as a matter of principle, I cannot say it was really palatable without sugar.' Margot Higgins, "Soy Products in National and International Programs: Field and Emergency Programs", *Journal of the American Oil Chemists' Society* 51(1974): 144.
[73] Marchione, 'Foods provided through U.S. government emergency food aid programs: policies and customs governing their formulation, selection and distribution', 2106. Ahlberg, *Transplanting the great society: Lyndon Johnson and Food for Peace*, 92. Ball and Johnson, 'Political, Economic, and Humanitarian Motivations for PL 480 Food Aid: Evidence from Africa'.

contracts from USAID, who paid them to enrich, blend, and pre-cook the cereal grains.[74]

More evidence for this interpretation can be found in the changing makeup of fortified flours. The famine foods exported by America were not stable, as one would expect from a perfectly objective, proven and specific famine food; their form often changed. Corn-Soy Milk (CSM) was a replacement for Dried Skim Milk (DSM), which was later replaced by Corn-Soy Blend (CSB), which then inspired Wheat-Soy Blend (WSB) and Soy-Fortified Bulghar (SFB). DSM was the preferred famine food in the 1950s, when there were massive surpluses of dried skim milk, but as these surpluses declined in the 1960s, CSM appeared on the scene. It was deliberately developed as one of the many 'milk substitutes', effectively bulking out a smaller quantity of dried milk with soy, maize, and vitamins, which were cheaper and in surplus. In the 1970s, dried milk surpluses disappeared almost entirely, and humanitarians saw the arrival of CSB. This replaced Corn-Soy Milk with Corn-Soy Blend, removing the expensive milk from the mix and concentrating on the commodities that remained in surplus. The availability of other fortified flours, such as Wheat Soy Blend, and Soy-Fortified Bulgur, have similarly reflected the comparative abundance of their component commodities.[75] The point here is not so much that the content of fortified food was purely dictated by American agricultural interests, but rather to suggest that commercial imperatives played a very important role – particularly in the mid-twentieth century. The reason we still distribute foods like CSB is not because they are more effective than any other food, but because they are widely available, and are a legacy of the productivist agricultural economy that is rooted in a particular historical period: between the 1930s and the 1970s.

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[74] Philip Payne, 'Maximising nutritional impact of feeding programmes' *Food Policy*, 8, no. 3 (1983). Reutlinger, 'The value of PL 480: A fresh look at PL 480, Title II'.
[75] Wallerstein, *Food for war - food for peace: United States food aid in a global context*; Patricia Dexter, 'Requirements for effective fortification in food aid programmes', in *Food Fortification: technology and quality control*, ed. Food and Agricultural Organization, (Rome: FAO, 1995), 78.

Conclusion

Today, fortified flours are no longer the products of American surpluses. The World Food Programme buys CSB from many places, including Kenya, South Africa, and Germany.[76] According to many accounts, the era of abundance ended in 1972, when oil prices rose, the cost of fertilisers went up, and production was scaled back. Shipping costs also rose, and government intervention declined. There was a dramatic fall in the amount of food available for export, and some have suggested we entered an era of 'post-productivist' agriculture that was subtly different from before.[77] Indeed, in light of the recent food crisis, we certainly cannot claim that circumstances today are anything like the golden age of productivism, with its related modernist faith in inexorably expanding yields.

However, my point in this chapter was not to argue that nothing has changed since the middle of the twentieth century; my aim was to suggest that the productivist era was crucial in shaping modern humanitarianism. These years, from the 1930s to the early 1970s, saw the fortified foods come into their own, a process that was particularly related to commerce. Just as the aim of the last chapter was to look at modernism, and the chapter before to look at the military, my aim in this chapter has been to focus on the *market*. I have argued that character of famine foods has been shaped by commercial concerns, particularly the opportunity to market a niche product, whilst utilising cheap wheat, corn and soy. To recapitulate the central

[76] In Yusuf Batil, for example, the Super Cereal Plus was a product of Germany. The procurement notes for the World Food Programme are available on the organisational website.
[77] For more on the distinctions between 'productivist' and 'post-productivist' agriculture, see Paul Cloke and Mark Goodwin, 'Conceptualizing Countryside Change: From Post-Fordism to Rural Structured Coherence', *Transactions of the Institute of British Geographers* 17, no. 3 (1992); Terry Marsden, 'Exploring a rural sociology for the fordist transition', *Sociologia Ruralis* 32, no. 2-3 (1992); For a response, see Geoff Wilson, 'From productivism to post-productivism … and back again? Exploring the (un)changed natural and mental landscapes of European agriculture', *Transactions of the Institute of British Geographers* 26, no. 1 (2001).

argument of this chapter, malnutrition offered opportunities for commerce, and commerce shaped what humanitarians provided. This is not the whole story: indeed, this chapter should be read in conjunction with the previous two, which discuss other factors. There is a nuanced and complex relationship between the market and emergency feeding, which can be captured in the title of this chapter and the phrase I discussed at the start: 'commerciogenic malnutrition'.

Although the structural circumstances have changed, commercial imperatives are still important in humanitarian relief. Common emergency foods today, such as the BP-5 or Plumpy'nut, are made by private companies for profit, and are manufactured from wheat, soy and their derivatives. In fact, given the success of Plumpy'nut, one could argue that the role of commerce has increased.[78] But alongside this trend, something else has also emerged: a vibrant opposition to the globalised system of food production. Led by journalists like Michel Pollan, we have catchy slogans and simplified manifestos, reminding everyone not just to eat local and organic, but to 'eat food'.[79] The campaigners point out that we spend our time eating nutrients rather than food, so we should concentrate on eating produce whose provenance we know and understand. This means eating whole foods, not the processed amalgamations of dextrin, high fructose corn syrup, defatted soy flour, and other derivative ingredients that are central to so many people's diets.

In these terms, CSM is not really 'food' at all. We are not familiar with its provenance and its connection to maize and soya is a distant one: it is highly processed, fortified, enriched, and often shipped half way around the world. But starving people do not have the luxury afforded to organic fetishists from the rich

[78] Stephen Hopgood and Leslie Vinjamuri, 'Faith in markets', in *Sacred aid: faith and humanitarianism*, ed. Michael Barnett and Janice Gross Stein, (Oxford: Oxford University Press, 2012); Christopher Spearin, 'Private, Armed and Humanitarian? States, NGOs, International Private Security Companies and Shifting Humanitarianism', *Security Dialogue* 39, no. 4 (2008); Jutta Joachim and Andrea Schneiker, 'New Humanitarians? Frame Appropriation through Private Military and Security Companies', *Millennium - Journal of International Studies* 40, no. 2 (2012).
[79] Michael Pollan, *In defense of food: an eater's manifesto* (New York: Penguin Press, 2008).

countries. They are perfectly capable of articulating their dislike for CSM, or CSB, or any of the other foods they are given, but they lack much power to do anything about it – particularly the financial ability to purchase foods they actually want to eat. Moreover, they probably perceive these flours as 'food' (although not very nice food), whatever Michael Pollan says.[80] This definitional question takes us back to the theoretical material from chapter three. Part of my argument in this thesis is that notions of food have been transformed by nutritionism. Adopting Latour and Mol's metaphysics, we can say that objects are a product of their relations. John Law has described this as a form of 'material semiotics', because objects are given meaning in the context of their surroundings.[81] What they *are* can be uncovered by analysing what they are *connected to*.[82] This 'anti-essentialist, open-ended and resolutely relational' way of understanding the world suggests that things can only exist by virtue of their interaction with other things, and that there is no unchanging essence, which we can finally understand. [83]

What does this mean for 'food'? Like everything else, it means 'food' is a network of heterogeneous relations – an expansive and inclusive definition, rather than a reductive one. In this sense, Latour and Mol's approach is the polar opposite of nutritionism. Whereas nutritionism reduces food to a biological interaction between nutrients and the body, Latourian ontology opens it up to include an almost infinite variety of connections. Whereas nutritionism suggests that food is just a vehicle for nutrients (its inner core, its foundational essence), Latourian ontology rejects such essentialism and suggests that food is made up of a complex network, which includes

[80] My regret at not being able to look more into recipient perspectives of fortified flour is discussed in chapter three.
[81] Semiotics is based on the idea that words are relational, and that we uncover their meaning through their context and connections. In the same way, material semiotics suggests that objects are relational, and that we understand them by examining *their* context: what they are connected with, how they fit into a network.
[82] Annemarie Mol and Jessica Mesman, 'Neonatal food and the politics of theory: some questions of method', *Social Studies of Science* 26, no. 2 (1996): 429.
[83] Saldanha, 'Actor-Network Theory and critical sociology', 421.

a vast array of things. To be clear: a food is not a food unless it contains nutrients (and it would be absurd to suggest otherwise), but Latour allows us to consider a wealth of other connections, which also constitute its definition. He reminds us that food is also connected to politics, to institutions, to ideas, and, above all, to people, and for something to be food, people must view it as food.

The last three chapters have told the story of emergency foods in the mid-twentieth century. Much of this narrative has concerned the discovery, development, and reception of these foods, but underlying the individual tales of military relief, modernist hope, and market imperatives, a more theoretical argument has been lurking. In these three chapters, I have described how our very notions of food were redefined in the twentieth century. Foods were reduced to nutrients, which, following Latour and Mol, did not just entail a new perspective on food; it redefined what food actually was. 'Food as nutrients', in other words, was not just a new idea, but a new object – something particularly clear if we look at the materiality of these fortified foods, their form, packaging, reception and use, which were new and original. Such a shift also had some profound political implications. The reduction of food to nutrients placed control in the hands of experts, who calculate the value of foods in ways that are unfamiliar. It takes power away from recipients, who are not enabled to buy, grow and eat the foods they are used to. The technological responses that follow represent a paucity of vision, which prioritise the nutritionally enhancement of gruels rather than changing the circumstances that condemn people to a terrible diet. The dominance of corn, soy and wheat, moreover, plays into the hands of food corporations, and buttresses an unsustainable system of global food production, which producing foods that are not even very nice.

These two arguments, the theoretical and the political, will become more important in the next part of this thesis, which moves from looking at food, to looking

at hunger. Whilst maintaining an emphasis on stories from the past, I will also build this picture of mid-twentieth century transformations, in which hunger and food were produced in new ways, leading to enduring changes for aid workers and the people they tried to assist.

PART III

MAKING HUNGER VISIBLE

INTRODUCTION TO PART III

Biafra was the beginning of modern humanitarian relief, a turning point in our story. It was here that intellectual ideas from the first half of the century were solidified into institutional arrangements, where the modern, technocratic world of aid was born. Until now, the focus of this thesis has been on food, but we turn now to hunger. Just as Biafra marks the beginning of modern emergency foods, it also marks the moment that anthropometric assessments were stabilised.

In this part of the thesis, my focus is primarily on a single object: the MUAC band. This generates a slightly different story from the last three chapters. In part II of this thesis I focused on a number of emergency foods. My aim was to account for the rise of a particular *kind* of food: the fortified flours and emergency biscuits that can be seen throughout the humanitarian industry today. This involved looking at these foods and drawing attention to their similarities – what they were made from, how they were produced, and the way they were embedded in a mixture of militarist, modernist, and market concerns. With regard to hunger, however, I will be looking less at the objects themselves (the instruments that measure malnourishment) and more at the circumstances that gave rise to them. This is partly because there is only one object that is truly influential – the MUAC band – but also because the emergence of this object depends on a much broader, theoretical story about anthropometry. In this part of the thesis I am concerned with the nature of anthropometry, the claims it makes, how it works, and its intellectual foundations. My overall aim is the same as the last three chapters – to account for the rise of the MUAC band as a particular *kind* of measuring instrument – but doing this requires much more engagement with theory. After all, this is really the story of a particular approach to hunger, a particular way of 'making hunger visible'.

Another reason for broadening the focus to anthropometry is that the story of the MUAC band seems deceptively simple. If we ignore its intellectual history and the assumptions on which it is based, we come up with a rather straightforward narrative, which goes something like this: The MUAC band was born in the 1950s, amongst paediatricians in Jamaica. When observing cases of infant malnutrition, they found that the decrease in muscle mass was greater than the decrease in overall body weight. The amount of muscle in the limbs, therefore, could be a much more sensitive indicator of malnutrition than the more traditional measures of weight, especially with babies and young children. Soon, nutritional surveys in the Caribbean began measuring muscle wastage as a matter of course, examining the size of the muscles on the calf (using measuring tape), the triceps (using skinfold callipers), and the upper arm. These methods were then included in a handbook on nutritional surveys, which was written by Derrick Jelliffe in the early 1960s and published by the World Health Organisation. This became particularly influential amongst doctors and nutritionists, and became the basis for a number of procedures in Biafra.[1]

In Biafra, many aid workers realised that the upper arm had numerous practical advantages over other ways to measure muscle wastage: it was a more

[1] This brief story of the MUAC band has been pieced together from contemporary journal articles, in which techniques of anthropometric measurement were described and defended. On the early use of the mid-upper arm circumference in Jamaica, see E. F. Patrice Jelliffe and Derrick Brian Jelliffe, 'The Arm Circumference as a Public Health Index of Protein-Calorie Malnutrition of Early Childhood: Background', *Journal of Tropical Pediatrics* 15, no. 4 (1969): 182; K. L. Standard, V. G. Wills, and J. C. Waterlow, 'Indirect Indicators of Muscle Mass in Malnourished Infants', *The American Journal of Clinical Nutrition* 7, no. 3 (1959). For its subsequent use in early-1960s nutritional surveys, see D. B. Jelliffe, 'Protein-calorie malnutrition in tropical preschool children: a review of recent knowledge', *The Journal of pediatrics* 54, no. 2 (1959); Derrick Brian Jelliffe and E. F. Patrice Jelliffe, 'Prevalence of Protein-Calorie Malnutrition in Haitian Preschool Children', *American Journal of Public Health* 50, no. 9 (1960); Jelliffe and Jelliffe, 'The Arm Circumference as a Public Health Index of Protein-Calorie Malnutrition of Early Childhood: Background', 182; John McFie and Hebe F. Welbourn, 'Effect of Malnutrition in Infancy on the Development of Bone, Muscle and Fat', *The Journal of Nutrition* 76, no. 2 (1962). For the influential handbook by Jelliffe, who was one of the nutritionists based in the Caribbean who had pioneered the approach, see Derrick Brian Jelliffe, *The assessment of the nutritional status of the community: with special reference to field surveys in developing regions of the world* (Geneva: World Health Organization, 1966). The importance of this handbook for doctors in Biafra was stressed in my interview with John Seaman, former Save the Children employee and doctor in Biafra, 18th April 2012.

accessible location, it was relatively non-invasive, and, unlike the legs, it was not vulnerable to oedema (a watery swelling that accompanies kwashiorkor). They also realised it could be used as a screening tool. Faced with large numbers of malnourished children, they needed some mechanism to determine who should be given access to their feeding programmes, so some humanitarian workers invented an object called the 'QUAC stick' – a word formed partly by the Quaker service workers who developed it, and partly by the Arm Circumference it relied upon.[2] The QUAC stick was a makeshift wooden ruler, held against a child to measure their height. Instead of being marked in centimetres or inches, however, it was inscribed with the limit measurements of a healthy arm circumference. By holding the stick against the height of the child, one could read out the smallest arm circumference that would be found in a healthy child; then, one could measure the child's arm circumference to see whether it fell above this minimum measurement.

The QUAC stick was used in Biafra as a way of categorising children for action: taking their arm circumference, and combining it with the height to see who should be eligible for feeding.[3] The following short narrative from a contemporary medical journal gives a sense of the process:

> The village chief was asked several days in advance to assemble all children under 10 years at a central place [and] at the appropriate time, the screening team arrives… Only one trained team member is needed to measure the arm circumference and check each child against the stick, while a local villager can mark the child on the forehead with gentian violet or some felt pen to indicate either 'M' or 'O'. Only those who fall into the malnourished ['M'] group are

[2] Alfred Sommer and Matthew Loewenstein, 'Nutritional status and mortality: a prospective validation of the QUAC stick', *American Journal of Clinical Nutrition* 28, no. 3 (1975). See also Black, *Children first*, 280; Ifekwunigwe, 'Recent field experiences in Eastern Nigeria (Biafra)', 149.

[3] Previous uses of the mid-arm circumference – in Jamaica and elsewhere – had been as part of a more comprehensive survey method; the QUAC stick turned it into a tool for rapid nutritional assessment. It used height as a proxy for age, just like in Yusuf Batil, and its limit measurements were based on the measurements from a reference population. For more on the statistical basis of this technique, see chapter eight.

> sent for registration and receipt of a food card. About 250 children can be screened in an hour by one trained person with the help of untrained local people. Since no large, heavy, bulky equipment is needed, this procedure can be performed anywhere.[4]

In this short quotation, we can see the main features of contemporary nutritional screening taking shape. The arm circumference had become combined with a screening process, registration cards, reliance on local labour, assembly in a central place, and cooperation from a 'traditional' chief. By the time of the Biafran war, it had become a system of remarkable efficiency, with people reduced to their bodies and their fate decided by a single measure. The quotation also stresses two key advantages of the procedure: it did not require extensive training, and it relied on no bulky equipment. We saw these same features in Yusuf Batil, and we can see them here in more nascent form.

The QUAC stick was transformed into the pared down MUAC band over the next few years. In the QUAC procedure aid workers used a simple length of measuring tape to examine the arm circumference, but the MUAC band had three new features that made it a simple and elegant object. First, it was given an insertion mechanism, which improved the reliability of its measurements. Second, it was given a bold traffic light colour scheme, which allowed it to be read by the illiterate. Finally, it was manufactured in new materials, which were waterproof, lightweight, and durable. By the late 1970s, all these features were combined in a version distributed by TALC (Teaching Aids at Low Cost), which became the prototype for many other versions, and which was later hailed by the Museum of Modern Art as a classic of modern design.[5]

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[4] Arnhold Rainer, 'The Arm Circumference as a Public Health Index of Protein-Calorie Malnutrition of Early Childhood: The QUAC stick', *Journal of Tropical Pediatrics* 15, no. 4 (1969): 244-45.
[5] 'Safe: Design Takes on Risk', Museum of Modern Art exhibition, 16 October 2005–2 January 2006. See www.moma.org/safe and http://www.moma.org/explore/multimedia/audios/20/510.

The insertion mechanism was introduced by Zerfas, appearing in 1975.[6] It was designed to address the problem of inaccuracy: standard measuring tape had to be skewed as it was wrapped around the arm, giving readings that were imprecise. One solution was to use a piece of string instead, since this was thinner – leading to objects such as the 'Shakir string' – but these were unable to measure in standard units like centimetres.[7] Zerfas suggested a measuring tape that was inserted into itself, with a small window for reading the circumference. In his paper, he proposes several versions, including one with numerals, one with lines, one with ratios, and one that calculated the diameter.

The colour coding was the second feature of the MUAC band. This had appeared on the Shakir string, which was a far bolder design since it did not mess around with numerals or exact measurements, but just placed arm circumferences into one of three categories: green to indicate a normal measurement, yellow to indicate 'possible mild malnutrition', and red to designate malnutrition.[8] David Morley had proposed the traffic light system several years earlier, and it was brought to the Shakir string and published jointly with Adnan Shakir in 1974.[9] The advantage was that the illiterate could use the tool, and soon all MUAC bands were colour coded as well as featuring numerals.

The final element to fall into place was the material. The MUAC band today is usually made from plastic, and it was only in the 1970s that suitable plastics were becoming cheap enough and widely available. Paper was no good, since it tore and got wet. Fabric stretched and created inaccuracies. PVC-coated fibreglass or linen was

[6] Alfred Zerfas, 'The insertion tape: a new circumference tape for use in nutritional assessment', *The American Journal of Clinical Nutrition* 28, no. 7 (1975).
[7] Adnan Shakir and David Morley, 'Measuring Malnutrition', *The Lancet* 303, no. 7860 (1974).
[8] Adnan Shakir, 'The Surveillance of Protein-Calorie Malnutrition by Simple and Economical Means', *Journal of Tropical Pediatrics* 21, no. 2 (1975); Shakir and Morley, 'Measuring Malnutrition'.
[9] David Morley, 'Prevention of protein-calorie deficiency syndromes', *Transactions of The Royal Society of Tropical Medicine and Hygiene* 62, no. 2 (1968): 207; Shakir and Morley, 'Measuring Malnutrition'.

too expensive, and the most effective material was cellulose acetate. This was either used to laminate paper, or to make MUAC strips out of old X-ray film, which was adopted in India in the 1970s.[10]

Alongside all these developments there were other approaches to measuring the arm circumference, which never took off in quite the same way, but which also grew from simple and low-cost designs. These included traditional bangles, which were fed up the arm to see if they will pass the bicep, something called a 'Quipu string', which was suggested by Derrick Jelliffe, and the simplest of all: feeling the arm to judge its size, which could be trained using pieces of wood of a certain diameter.[11] None of these, however, seemed as effective as the MUAC band, which became so central to humanitarian relief that it was later fetishized by MSF as the 'bracelet of life'.[12] The message was that a simple object can tell a doctor or nurse 'how seriously malnourished a child is and what treatment they need', giving the opportunity of life in the process. The object, in this portrayal, is the thing that gives life; the MUAC band, on its own, enables the child to recover.

This, very briefly, is the story of the physical object – the MUAC band. It is not, however, the story of anthropometry. The arm circumference, after all, is just one of many anthropometric measurements, which include the calf measurement, the head circumference, and the height, which have all been used to judge malnourishment in the past. The arm circumference has become the most important because of its

[10] K Ramachandran et al., 'Limitations of film strip and bangle test for identification of malnourished children', *The American Journal of Clinical Nutrition* 31, no. 8 (1978); Derrick Brian Jelliffe and E. F. Patrice Jelliffe, *Community nutritional assessment: with special reference to less technically developed countries* (Oxford: Oxford University Press, 1989), 96.

[11] M. Laugesen, 'Child's bangle for nutrition screening', *Indian Journal of Pediatrics* 12(1975); Morley, 'Limitation of film strip and bangle test for identification of malnourished children'; Ramachandran et al., 'Limitations of film strip and bangle test for identification of malnourished children'; Derrick Brian Jelliffe and E. F. Patrice Jelliffe, 'The quipu in measuring malnutrition', *The American Journal of Clinical Nutrition* 28, no. 3 (1975). This last technique was inspired by the knotted strings used by the Inca to record events. A very comprehensive summary of MUAC methods can be found in *Community nutritional assessment*, 91-103.

[12] Redfield, 'Doctors, borders, and life in crisis', 345. See also http://www.doctorswithoutborders.co.nz/education/activities/braceletoflife/index.html.

practical use in disasters, but in exploring the history of the MUAC band, we must explore far beyond the physical properties of the band itself, beyond the material it is made from, the colours it is painted, and its other practical advantages. Although these are important, they are not as important as the intellectual foundations of anthropometry more generally, which have shaped humanitarian action more than the physical characteristics of the MUAC band. The refinement of the MUAC band is a fairly arid story, but the intellectual foundations of anthropometry are far more significant, coming to define what hunger is as well as the ways it is made visible.

Over the next two chapters I delve into these foundations, dividing them into two main themes. First, I look at the medicalization of hunger: the quest for detailed knowledge of the body and its reaction to starvation. This generated the idea that malnourishment takes place at the biochemical level, at considerable remove from what is directly observable. Second, I look at the role of statistics, particularly the idea that all humans can be reasonably compared with one another, and the creation of the idea of 'normality'. This makes one person's malnourishment comparable with another, and generates a standard against which others can be held. Both these phenomena – which I summarise as the power of *specifics* and the power of *statistics* – are preconditions for anthropometry. When hunger is seen as a biochemical phenomenon, anthropometry seems a scientific method for revealing what cannot be seen directly. When people are seen as comparable, anthropometry can help define what is abnormal and use this as a basis for interventions. My aim in this section is to examine and critique these intellectual foundations, raising questions, once again, about the objectivity of contemporary humanitarian nutrition.

7.

Man's lyrical core

Specifics, typologies, and the medicalization of hunger

In the middle of the 19th Century a new word, 'malnutrition', entered the English lexicon. Imported from the French, it came to reflect an interest in precise nutritional disorders. Hunger is usually defined as a sensation: the feeling caused by temporary or persistent lack of food. Starvation is usually defined as a condition, where the shortage of food begins to threaten life. Malnutrition, however, explicitly links health with nutrients. It refers to a medical state of deficiency or imbalance, in which people lack the components in food that are necessary to health. Unlike the other two terms, it is intrinsically related to nutritional reductionism. Whereas hunger and starvation imply a shared experience, malnutrition designates a specific, individual condition. Whereas hunger is a social experience, malnutrition refers to a narrow biological state.

The idea of malnutrition thrives on detail. An individual suffers from a type of malnourishment, a *kind* of deficiency. It is no coincidence that the word became more common in the 1910s and 1920s, just as the 'newer' knowledge of nutrition was emerging.[1] As vitamins were discovered, and their absence associated with longstanding diseases, 'malnutrition' became an umbrella for a variety of deficiency diseases, a term that gathered various conditions and explicitly linked them with nutrients.[2] It led to a number of studies regarding the effects of hunger on the body, which represented a distinct historical departure.[3] Previously there was just one

[1] Michael Worboys, 'The discovery of colonial malnutrition between the wars', in *Imperial medicine and indigenous societies*, ed. David Arnold, (Manchester: Manchester University Press, 1988). A crude indicator of the word's rising significance can be found using Google's Ngram viewer. For background to the 'newer knowledge of nutrition', see chapter four.

[2] Madeleine Mayhew, 'The 1930s Nutrition Controversy', *Journal of Contemporary History* 23, no. 3 (1988).

[3] The first of these studies was the Carnegie experiment, see James Arthur Harris and Francis Gano Benedict, *A biometric study of basal metabolism in man* (Washington: Carnegie Institution, 1919). This

medical name for starvation: marasmus, a Greek word for wasting, which had been used in English since at least the Middle Ages. But with the discovery of vitamins came a multitude of new dietary diseases: scurvy, pellagra, rickets and beriberi were discovered, and kwashiorkor emerged as an oedematous version of starvation.[4] Where once was one hunger, there emerged a multitude of hungers, and the next step, after vitamins had settled into scientific acceptance, was to further disaggregate starvation with a description of other clinical symptoms – beyond wasting – that accompanied persistent shortage.

By the 1930s and 1940s there was a rapid expansion of interest in the physiological experience of hunger, from the concentration camps of Europe to the university campuses of the American mid-West. We have already seen how, after the liberation of Belsen in 1945, the bodies of emaciated holocaust victims were examined, and newly manufactured treatments such as protein hydrolysates administered intravenously into their wasted flesh.[5] In this chapter we examine a number of other examples from the same era. In the clinics of the Warsaw ghetto, Jewish conducted tests on the thin and withered people that had come into their care.[6] In the Japanese-occupied Far East, British medical officers carefully tallied the nutritional disorders of long-term Prisoners of War.[7] At the University of Minnesota, volunteers were starved for six months and were thoroughly examined as their bodies

looked in unprecedented detail at the physiological effects of starvation. Later experiments, such as the Minnesota studies (see below), were based on this forerunner.

[4] J. D. Hansen, 'Protein-Energy Malnutrition ', in *The Cambridge world history of food*, ed. Kenneth F. Kiple and Kriemhild Coneè Ornelas, (Cambridge: Cambridge University Press, 2000). Scurvy is a vitamin C deficiency; Pellagra a deficiency in Niacin, or vitamin B3, Beriberi a deficiency in thiamine, or vitamin B1, and rickets is a deficiency in vitamin D. These conditions had been known about for years, but it was only with the discovery of vitamins that these could be identified as *deficiency* diseases, and only when a variety of deficiency diseases were identified that the umbrella term, malnutrition, became widely required.

[5] See chapter four. For a brief overview of this story, see Shephard, 'The medical relief effort at Belsen'.

[6] The results of these experiments were published as Myron Winick, ed. *Hunger disease: studies by the Jewish physicians in the Warsaw Ghetto*, (New York: Wiley, 1979). They are discussed further below.

[7] These experiments were not fully published, but there are extensive records at the archives of the London School of Hygiene and Tropical Medicine in London, files NUT/11.

wasted away.[8] All of these experiments sought to understand what went on in the bodies of the starving. They described the effects of hunger in minute detail and contributed to a field of starvation medicine, whereby malnourishment was understood as a mismatch between the biochemical needs of the body and the biochemical content of the diet.

This chapter examines these experiments, arguing that a 'medicalization of hunger' took place in the 1930s and 1940s, which had a lasting effect on humanitarianism by creating the conditions for nutritional anthropometry. The medicalization of hunger, I suggest, was characterised by a concern for specifics. It sought to understand the precise anatomical effects of hunger, and it endeavoured to disaggregate hunger into many different types. Most importantly for humanitarianism, it generated the idea that malnourishment takes place deep inside the physique. By searching for the physiological details of starvation, these 'hunger studies' reinforced the view that malnutrition was a biochemical condition. They focused on cells and nutrients, implying that true malnourishment could not be observed without medical techniques and laboratory tests. The first two sections in this chapter discuss examples of this trend, looking first at the discovery of kwashiorkor, and then at the post-war starvation studies in the Warsaw ghetto and the University of Minnesota. The last part of this chapter then shows how this enabled the rise of anthropometry. By focusing on invisible biochemical processes, the medical perspective on hunger allowed anthropometry to emerge as a way to reveal what could not be seen directly. Without claiming to diagnose or define malnourishment, anthropometry promised to make hunger visible to the aid worker in a quick and efficient manner: locating it on the physique, through a rapid measurement of the arm.

[8] The full monograph of these experiments was published as Ancel Keys et al., *The biology of human starvation* (Minneapolis: University of Minnesota Press, 1950). Further details below.

Medicalising hunger

A good way of understanding the medicalization of hunger is through Foucault's work on autopsies and the clinical gaze. Despite the empirical problems with his histories, Foucault identifies some profound intellectual transitions, and of particular relevance to this chapter is his book, *The Birth of the Clinic*, which describes how the autopsy emerged from religious and cultural prohibition to become an important source of knowledge about death and disease.[9] Before the autopsy, Foucault argues, death had been presented as an external force. It came from outside the body, as a visitation that overwhelmed and eventually overcame life. Death, in this reading, was everywhere. It affected everyone and could strike at any time. It was the great leveller of the medieval world, which was represented by the grim reaper, a figure who could take anyone away without warning. The regularity of illness in the medieval world was presented as evidence of death's constant proximity.

The autopsy, however, transformed our understanding of death. Once the human anatomy was illuminated and examined, death could be understood and tamed. Death was no longer a universal experience, but a specific experience. Now, it had a particular cause, which could be uncovered. Death no longer visited the body from outside, but came from the inside. Now, it was identified with an underlying pathology. Death was no longer an external force fighting against the body, but became intrinsic to it, a persistent potential for malfunction. Death became something through which someone's life was defined, something that revealed their individual conditions. Foucault articulated this idea in the following, poetic phrase: 'death left its old tragic heaven and became the lyrical core of man.'[10]

[9] Michel Foucault, *The birth of the clinic: an archaeology of medical perception* (London: Tavistock, 1976), 146-55.
[10] *The birth of the clinic*, 176.

The result was a profusion of detailed knowledge about the body and its problems. Rather than one death affecting everyone (personified in the grim reaper), there emerged a multitude of deaths, attacking different people and different parts of the organism at different times. Typologies of disease became multiple, and death or illness meant an intricate search for specifics: a hunt for the exact physical cause of any mortality or malady. In this chapter, I argue that a similar shift occurred with respect to hunger in the middle of the twentieth century. By the end of the 1930s, there was a distinct change in focus from starvation as a general experience, to starvation as a specific experience. Whereas at the turn of the century there was one kind of hunger – marasmus, a simple lack of food – by the second world war, starvation had multiplied, becoming a number of more specific conditions, beginning with the vitamin deficiency diseases, continuing with the discovery of kwashiorkor, and culminating into the disaggregation of starvation into different forms and degrees.

This 'medicalisation of hunger', I argue, changed the focus of starvation studies from examining the external causes of starvation to examining its internal causes. At the turn of the century hunger was more likely to be examined using the tools of political economy, sociology, or agriculture. Scholarly work concentrated on dietary patterns, systems of production and the skills or ignorance of communities. Hunger's cause was located externally, in the political economy of wages or in the culture of the savage tribe. But the medicalization of hunger saw attention shift to *inside* the body. Starvation began to be located internally. It was understood as a medical problem, its causes sought inside the physique. The medicalization of hunger led to the search for detailed knowledge about its internal causes and manifestations. Starvation was no longer seen as a horseman of the apocalypse: external, ever-present, rooted in social conditions. It was located inside the body, its biochemical manifestations teaching us something profound. In the terms of Foucault, hunger was

no longer a tragic, external visitation, but became part of a person's lyrical core; our lives made reducible to biochemical interactions.

The story of kwashiorkor

Nowhere is this shift more evident than in the discovery of kwashiorkor. Although the first stirrings of hunger's medicalization occurred in the 1920s, with the discovery of vitamins, deficiency diseases, and the first detailed physiological experiments into the biology of starvation, the discovery of kwashiorkor solidified a number of key ideas: that the key to understanding starvation could be found within the body, that the proximate cause of starvation could always be sought, and that starvation could be disaggregated into types. Kwashiorkor also offers a particularly good illustration of hunger's medicalization because it is possible to draw a stark contrast between the way Western doctors interpreted the disease, and the way this disease was understood by the inhabitants of the Gold Coast – the territory in which Cicely Williams 'discovered' kwashiorkor in the early 1930s.

The following discussion offers a challenge to existing historiography around kwashiorkor, which tends to present Cicely Williams as 'listening to the Ga': being sensitive and responsive to the Ghanaian people. Without wanting to denigrate her work in the slightest – after all, Williams identified the evils of dried milk promotion long before the Nestle boycott of the 1970s – I want to draw attention to her work as an example of hunger's medicalization. I argue that the addition of kwashiorkor to the Western medical canon may have adopted the 'native' word, but it transformed the meaning, isolating its social connotations and configuring it as a distinct kind of deficiency. It began a process whereby it was no longer enough to say 'this person died of hunger because they were poor', because one had to identify a specific

biochemical cause. It set the stage for modernist protein supplements, which, as we saw in part II of this thesis, conceived kwashiorkor as a protein deficiency and generated technocratic solutions to this deficiency whilst glossing over the politics of hunger.

The origins of kwashiorkor

Kwashiorkor is very different from marasmus, characterised not by wasting but by swelling. It appears not as the skeletal remains after muscle and tissue have been consumed, but as oedematous, swollen limbs and stomach. It tends to be associated in the public mind with the distended bellies of famine victims in Biafra, but this condition was first described in print in 1908, and was given its current name, accompanied by a detailed clinical description, by Cicely Williams in 1935.[11] Williams, who was working in the Gold Coast as a Colonial Medical Officer at the time, noticed a recurring set of symptoms amongst young children: oedema in the hands and feet, darkening and thickening of the skin followed by peeling, and a reddish tinge to the hair in the worst cases. There was a clear pattern in the incidence of this disease, since it occurred in children who had been weaned onto low-protein, starchy foods such as maize, after being displaced from the breast by a younger sibling. Williams' description first appeared in print in 1933, and two years later she identified the condition by its name in the local language: kwashiorkor, the 'disease of the deposed child'.[12]

[11] H. C. Trowell, J. N. P. Davies, and R. F. A Dean, *Kwashiorkor* (London: Arnold, 1954), 13. The 1908 description was from Mexico, although the earlier date of 1865 has been suggested (without citation) by John Waterlow, *Protein-energy malnutrition* (London: Edward Arnold, 1992).
[12] Cicely Williams, 'Kwashiorkor: a nutritional disease of children associated with a Maize diet', *The Lancet* 226, no. 5855 (1935); Cicely Williams, 'A nutritional disease of childhood associated with a maize diet', *Archives of disease in childhood* 8, no. 48 (1933). For a fuller account of the origins of kwashiorkor, see Sally Craddock, *Retired except on demand: the life of Dr Cicely Williams* (Oxford: Green College, 1983); Ann Dally, *Cicely: the story of a doctor* (London: Gollancz, 1968); Cicely

It took twenty years for kwashiorkor to gain medical acceptance and become the target of humanitarian programmes. Although descriptions of the condition had been trickling in from around the world, accompanied by a variety of different names, from the colloquial ('red baby'), to the medical ('dyschronic oedematous syndrome'), many commentators denied that these observations constituted anything new, either interpreting them as an existing disease or as an unrelated collection of symptoms.[13] The name and diagnosis provided by Cicely Williams was contested, with the strongest resistance coming from specialists in pellagra: a niacin deficiency disease that led to similar patches of thickened skin, which was also associated with a maize diet. A physician called Hugh Stannus, in particular, issued withering responses to Williams' papers of 1933 and 1935, accusing her of failing to recognise pellagra, which, he said, should be obvious to anyone with extensive clinical experience.[14] These disputes, acrimonious as they were, were part of the process of stabilising kwashiorkor as a medical fact.[15] In Latour's terms, they were part of a twenty-year period in which the 'black box' was closed, controversy was shelved, and physicians agreed on the existence of something new. By the early 1950s, kwashiorkor had become accepted as a coherent entity, marked by a prominent WHO report that declared it 'the most serious and widespread nutritional disorder known to medical science' and a detailed scholarly monograph.[16]

Williams, 'The story of kwashiorkor', *Nutrition Reviews* 31, no. 11 (1973); H. C Trowell, 'The beginning of the kwashiorkor story in Africa', *Central African Journal of Medicine* 21, no. 1 (1975).

[13] Trowell, Davies, and Dean, *Kwashiorkor*, 2-9.

[14] Hugh Stannus, '"Kwashiorkor"', *The Lancet* 226, no. 5856 (1935); Hugh Stannus, 'A nutritional disease of childhood associated with a maize diet - and pellagra', *Archives of Disease in Childhood* 9, no. 50 (1934). Much of this reluctance to accept Cicely Williams' diagnosis was a result of reflex sexism, and the unfamiliarity of having a woman suggest a new disease in a male-dominated profession. Discrimination dogged Cicely Williams throughout her life, even amongst her eventual supporters, one of whom attributed her success to 'being a lady, and a very gracious lady at that', which allowed her to 'arrive by instinct at the correct answer'. See Trowell, 'The beginning of the kwashiorkor story in Africa'.

[15] For a particularly good account of this controversy, see Carpenter, *Protein and energy*, 142-60.

[16] Brock and Autret, *Kwashiorkor in Africa*; Trowell, Davies, and Dean, *Kwashiorkor*.

Stripping social associations

Three key features emerge from this process of acceptance and stabilisation, which shed light on the medicalization of hunger. The first was a profound suspicion of local knowledge. In disputes around the nature of the new disease, resistance emerged towards the name 'kwashiorkor'. Stannus, for example, quickly objected to the use of a 'West African native word', complaining that it would be confusing, and objecting to its association with a 'common superstition' in Africa: the belief that 'each successive child pushes the previous one into its grave'.[17] For Stannus, as for many other commentators, African words had no place in Western medicine, especially when the terminology was associated with irrational beliefs. This 'juju' word, which was such bad luck it took years to be uttered in Cicely Williams's hospital, was treated as a taboo that was in need of destruction, not recognition; something that needed to be shattered with the light of reason, not adopted as a descriptive label and entered into the canon of Western medicine.[18]

It was to Cicely Williams' great credit that she appreciated the significance of the 'native word', and vigorously defended its use. Through its translation as 'the disease of the deposed child', she realised that kwashiorkor was caused by displacement from the breast, so must have something to do with the absence of milk in the diet. But although Williams did, to a certain extent, 'listen to the Ga', as Jennifer Stanton has put it, she heard only part of the message.[19] Williams did not simply adopt the native word, she transformed it, fitting the condition into a medicalised paradigm and missing its social significance. Kwashiorkor came to designate, narrowly, a protein deficiency, when it had previously been laden with

[17] Stannus, '"Kwashiorkor"', 1207.
[18] Craddock, *Retired except on demand*, 62.
[19] Stanton, 'Listening to the Ga'.

social meaning. In the language of the Ga, the word had designated a *social* problem: the risk of being a child, in a series of closely spaced siblings, in a resource-poor setting. As Felix Konotey-Ahulu has pointed out, kwashiorkor was a 'sibling positional word' in the local vernacular; it was a term that connoted the social situation of the sufferer.[20] It implied that weaned infants were very vulnerable because they have been 'deposed from the breast' (something Williams had recognised), but it also designated the ever-presence of death in communities with entrenched poverty and large families.

In stripping the term of these social connotations, Williams and her successors medicalised the condition, reconceiving the condition as a deficiency. In their hands, kwashiorkor was characterised by an absence, not by a presence: a lack of protein, not the existence of a network of causes. From designating a social relationship of closely spaced siblings in a resource-poor setting, it became the failure to eat a certain kind of food. This made it compatible with another method for undermining indigenous knowledge: the paradigm of ignorance. Once kwashiorkor was reduced to a deficiency, its occurrence could be presented as a failure on the part of mothers to realise the need for protein and a failure to provide it to their families. This was a well-worn connection in the annals of nutritionism, but when applied to kwashiorkor, the paradigm of ignorance took on newly racist overtones.[21] It criticised Africans for a failure to breastfeed according to a rigorous time schedule, a failure to regulate the spacing of their babies, and a failure to buy tinned milk that would adequately nourish

[20] Felix Konotey-Ahulu, 'Kwashiorkor', *British Medical Journal* 302, no. 6769 (1991); Felix Konotey-Ahulu, 'Issues in kwashiorkor', *The Lancet* 343, no. 8896 (1994).

[21] The idea of ignorance as a cause malnutrition has been a common theme in the history of hunger. It has long been opposed by radicals who emphasise structural causes instead, pointing to colonial policies or low wages. Worboys describes this as the difference between an 'endemic' and 'epidemic' view on colonial malnutrition. Worboys, 'The discovery of colonial malnutrition between the wars', 222. Wylie describes the paradigm of ignorance in lovely detail. Diana Wylie, *Starving on a full stomach: hunger and the triumph of cultural racism in modern South Africa* (London: University Press of Virginia, 2001), 1-19. Vernon describes how it was used in Britain, to blame working class hunger on the ignorance of housewives. Vernon, *Hunger*, 196-235.

their offspring.[22] As Megan Vaughan has argued, biomedicine was central to colonialism, a key plank in the civilizing mission and a central tool for regulating the labour force and separating the races; it was accompanied by profound reluctance to accept that science might have something to learn from imperial subjects.[23]

Accumulating physical detail

The second main feature of kwashiorkor's acceptance was its reliance on intricate physiological detail. In order to get the disease recognised, Cicely Williams had to accumulate a mass of information on its manifestations and causes, and defend these against commentators such as Hugh Stannus. Through autopsies, for example, Williams established the unique anatomical features of the disease, particularly the presence of a fatty liver. As well as being reminiscent of Foucault's work on the clinical gaze, such a drive for detail has also been identified by Thomas Lacqueur as an important sign of truth in modern humanitarian narratives. Through the emergence of autopsy, 'unprecedented quantities of minute observations' became the building blocks of a factual account, in which the suffering of others, and their causes, were made real.[24] For kwashiorkor to be accepted, in other words, detail had to be accumulated, the internal workings of the body had to be revealed, and the exact conditions that led to the emergence of this condition had to be isolated and established.

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[22] Brock and Autret, *Kwashiorkor in Africa*, 32. "Throughout Africa (except among a very small group of educated Africans) breast feeding is given 'on demand' rather than according to a time schedule" (Brock and Autret 1952:32); Williams, 'A nutritional disease of childhood associated with a maize diet'; Stanton, 'Listening to the Ga', 160.

[23] Megan Vaughan, *Curing their ills: colonial power and African illness* (Cambridge: Polity, 1991). See also Michael Adas, *Machines as the measure of men: science, technology, and ideologies of Western dominance* (Ithaca: Cornell University Press, 1990); Daniel Headrick, *The tools of empire: technology and European imperialism in the nineteenth century* (New York ; Oxford: Oxford University Press, 1981).

[24] Thomas Laqueur, 'Bodies, details, and the humanitarian narrative', in *The new cultural history*, ed. Lynn Avery Hunt, (Berkeley: University of California Press, 1989), 177.

The accomplishment of autopsies, however, relied on the cooperation of Ga mothers, who viewed kwashiorkor rather differently. In the account given to her biographer, Cicely Williams explained the obstacles she faced in conducting autopsies in the Gold Coast.[25] The mothers of dead children, she explained, whisked their children away from the hospital as soon as they died or were close to death – a practice that was widely understood to be the result of custom, which demanded burial in the child's compound before sunset. But after talking with the mothers, Williams identified another possible cause. Local bus drivers, it was reported, levied an extra charge for transporting corpses, which led the mothers of dead or dying children to whisk the bodies away. By compensating mothers for the higher bus fare, Williams gained consent for autopsies, offering, in the view of her biographer a solution that was 'so simple, but one that no other European had thought of [before]'.[26] But it was a solution that raises more questions than answers: Was the reluctance of mothers really down to the policy of bus drivers and the higher fare they were charged? Or were mothers just looking for a financial incentive to participate in an unusual practice? Did involvement in a post-mortem still constitute the violation of an important custom? Or were the mothers able to adhere to cultural rules *and* find a way of receiving money from a white doctor?

It is very likely that post-mortems seemed unnecessary to the Ga, who had always located the kwashiorkor in a social relationship, and saw little need for the quest for anatomical detail. In their interpretation, kwashiorkor was explained by the position of the sibling, the circumstances of dearth, and the presence of a curse that had been placed upon the suffering child; in other words, the nature of the condition was to be found *outside* the body, rather than within it. To the extent that the autopsies led to difficult ethical terrain for Cicely Williams – which, it must be said,

[25] Dally, *Cicely: the story of a doctor*, 48-53; Craddock, *Retired except on demand*, 63.
[26] *Retired except on demand*, 63.

there is all evidence she was aware of – there were even greater moral implications in a second source of detail about the disease: the trialling of different diets. Based on the assumption that kwashiorkor was a nutritional deficiency disease, doctors had been experimenting with dietary plans that might help the children recover, and the colonial world was treated as a vast nutritional laboratory, in which highly invasive interventions could be applied to sick African children in an attempt to test distant theories.[27] As we have seen, foods as diverse and unfamiliar as dehydrated liver, desiccated stomach, proteolysed meats, casein hydrolysates, marmite, Bemax, and cod-liver oil were all used in the treatment of kwashiorkor.[28] Physicians applied treatments to test their personal theories, with those believing the disease was a form of pellagra injecting children with nicotinic acid, those suspecting it was beriberi administering thiamine, with the intravenous administration of proteins becoming more common in the early 1940s. These experiments were to the detriment of the kwashiorkor sufferers, many of who died as a result of such interventions, particularly after vitamin injections.[29]

Seeking technical solutions

The third feature of kwashiorkor's path to medical acceptance lies in this search for a technical solution. As it became widely agreed that protein deficiency

[27] See chapter four.
[28] Carpenter, *Protein and energy*, 148; H. C. Trowell, 'Malignant malnutrition (Kwashiorkor)', *Transactions of the Royal Society of Tropical Medicine and Hygiene* 42, no. 5 (1949); Joseph Gillman and Theodore Gillman, *Perspectives in human malnutrition: a contribution to the biology of disease from a clinical and pathological study of chronic malnutrition and pellagra in the African interior* (New York: Grune and Stratton, 1951); Theodore Gillman and Joseph Gillman, 'Hepatic damage in infantile pellagra and its response to vitamin, liver and dried stomach therapy as determined by repeated liver biopsies', *Journal of the American Medical Association* 129, no. 1 (1945).
[29] Carpenter, *Protein and energy*, 146-8. In 1940, Hugh Trowell recommended a diet of 'nicotinic acid injections, blood transfusions, marmite and a diet rich in protein' as a treatment for kwashiorkor. H. C. Trowell, 'Infantile pellagra', *Transactions of the Royal Society of Tropical Medicine and Hygiene* 33, no. 4 (1940): 403. He later lamented the death of children at his hands as a result of the injections. See Trowell, 'The beginning of the kwashiorkor story in Africa', 3.

was the cause of the disease, a number of protein-rich diets were developed for the suffering child. From dehydrated liver and desiccated stomach, more efficient responses were created, involving proteins that had been isolated from foods and manufactured in bulk.[30] In 1955, an arm of the United Nations – the Protein Advisory Group – was established to coordinate research and generate policy, responding to a widely perceived 'protein gap', which was presumed to exist throughout the developing world.[31] To this problem, technical solutions emerged in their hundreds, ways of plugging the gap, manufacturing protein, and fortifying foods with synthetic amino acids. These policies were largely undertaken with good intentions, but they were characteristic of a medicalised approach, which saw an intrinsic value in isolating the exact nature of kwashiorkor and treating it with chemical compounds.

The crucial aspect of these responses, as has been argued throughout this thesis, is the complexity of their nature and the irony of their failure. Whilst they were carefully distinguished as rational and scientific responses to a global problem, they were, themselves, embedded in cultural predictions, commercial interests, and faulty logic. In a famous article of 1974, Donald McLaren criticised the undue attention on protein supplements, calling it 'The Great Protein Fiasco'.[32] The fiasco, he argued, was a misplaced emphasis on kwashiorkor and protein, which had dominated international policy since the 1950s. The far bigger problem, for McLaren and many others who came to support him, was marasmus: wasting caused by a lack of energy, or, to put it another way, a simple lack of food. In the meantime, a great deal of money had been spent on research and protein production, a huge commercial

[30] P. J Pretorius and Z. M. Smit, 'The effect of various skimmed milk formulae on the diarrhoea, nitrogen and initiation of cure in kwashiorkor', *Journal of Tropical Pediatrics* 4, no. 2 (1958).
[31] Josh Ruxin, 'The United Nations Protein Advisory Group', in *Food, science, policy and regulation in the twentieth century: international and comparative perspectives*, ed. David Smith and Jim Phillips, (London: Routledge, 2000).
[32] McLaren, 'The great protein fiasco'; Carpenter, *Protein and energy*, 198; James Newman, 'From definition, to geography, to action, to reaction: the case of Protein-Energy Malnutrition', *Annals of the Association of American Geographers* 85, no. 2 (1995).

industry had emerged associated with food supplements, and all this had been driven by a Western culture that placed a disproportionate value on meat.[33]

As the 'protein fiasco' developed, it turned out that kwashiorkor was not only exaggerated in extent, it was also simplified in causation. From the very beginning, Williams assumed that because milk enabled children to recover, the cause of kwashiorkor was a lack of milk, and therefore, protein. But it was pointed out as early as 1955 that this assumption was a failure in logic: if an aspirin cures a headache, we do not immediately assume that the patient has been suffering from aspirin deficiency.[34] Moreover, evidence from the 1960s demonstrated that a less protein-rich, more balanced diet could cure kwashiorkor equally well, and by the 1970s a number of other causes for the disease were suggested. Even today, the details of kwashiorkor are still not fully understood, and nor are its physiological causes.[35] Does this really matter? As Guy Baily has pointed out, it is unclear whether this quest for 'reductionist knowledge' really benefits the poor. After all, the situations that give rise to it remain well known and 'starkly simple': considerable poverty combined with a poor, restricted diet. In lamenting the pointless minutiae of much kwashiorkor literature, Baily suggested it amounted to 'fiddling while children starve', even suggesting that 'third-world health might be better served if the budgets of research institutes were distributed as ten dollar bills to the poor and undernourished'.[36]

The search for anatomical detail, therefore, can have little value to the starving. What remains outside the nutritional paradigm is the simple fact that food is

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[33] Paul Diener, 'Humanism and science in cultural anthropology: the great protein fiasco', *Journal of Social Philosophy* 15, no. 1 (1984); Paul Diener, Kurt Moore, and Robert Mutaw, 'Meat, markets, and mechanical materialism: the great protein fiasco in anthropology', *Dialectical Anthropology* 5, no. 3 (1980). As a result of the protein fiasco, the PAG was dismantled in 1977.
[34] Waterlow, *Protein-energy malnutrition*.
[35] Michael Krawinkel, 'Kwashiorkor is still not fully understood', *Bulletin of the World Health Organization* 81, no. 12 (2003); Michael Golden, 'The Development of Concepts of Malnutrition', *Journal of Nutrition* 132, no. 7 (2002); Michael Golden, 'Oedematous malnutrition', *British Medical Bulletin* 54, no. 2 (1998); John Speth, *The Paleoanthropology and Archaeology of Big-Game Hunting* (New York: Springer 2010), 45-85.
[36] Guy Baily, 'Fiddling while children starve?', *The Lancet* 342, no. 8885 (1993).

the obvious cure. Despite the massive investments in technology and science in the 1960s, there was really no need for complex nutritional supplements and high-protein diets derived from fish, leaf, and synthetic proteins. Most people, given adequate income, are perfectly capable of eating a decent diet without technological interventions. When we rely on a view of hunger that focuses so narrowly on physiological processes, we miss the political and social systems that keep people poor and undernourished. As McLaren suggested back in 1974, research into kwashiorkor and protein was a waste of resources; for all its value in knowledge creation for its own sake, this work was meant to benefit the hungry, something it manifestly failed to do.

The World War Two hunger studies

It is often said of 'discoveries' in Africa that they were no such thing: Europeans were simply finding something that Africans had always known. There was certainly an element of this in the discovery of kwashiorkor. Kwashiorkor was a common experience for Africans in the Gold Coast; it was something about which they had knowledge long before the colonials published in scholarly journals.[37] But to criticise the work of Cicely Williams in this way is to ignore what was *produced* in this period. When Williams wrote about kwashiorkor in the *Lancet*, she was, in fact, creating something new.[38] She was not just describing a long-standing condition and

[37] As Hugh Trowell noted with some irony, when looking back at the story in 1975: 'the ignorant Africans recognised a disease that we had missed'. Trowell, 'The beginning of the kwashiorkor story in Africa', 2.

[38] It has long been recognised that the discovery of disease is a social process, in which diverse phenomena are observed, grouped, and named. As Charles Rosenburg said, 'disease does not exist until we have agreed that it does, by perceiving, naming, and responding to it'. This idea does not start with Latour. Charles Rosenberg, 'Framing disease: illness, society, and history', in *Framing disease: studies in cultural history*, ed. Charles Rosenberg and Janet Lynne Golden, (New Brunswick: Rutgers University Press, 1992), xiii; Charles E. Rosenberg, 'Disease and Social Order in America: Perceptions and Expectations', *The Milbank Quarterly* 64, no. 1 (1986).

using a pre-existing word; she was transforming the condition *and* the word, generating a new form of malnourishment. She may have adopted the native term, but she did not adopt the native understanding, nor simply publicise what had already been known. In the hands of Cicely Williams and her interlocutors, kwashiorkor was medicalised: extracted from social causes, identified with a nutritional deficiency, and made amenable to a technological response. Later in this chapter, I link this to Mol's idea of multiple ontologies. Starvation in the form of kwashiorkor became a new object, a new form of hunger.

Williams and her interlocutors also generated a large amount of detail. By testing possible solutions, undertaking autopsies, and producing detailed clinical examinations of suffering bodies they produced a massive literature, describing what kwashiorkor looked like, where it might be found, and its impact on the body. This became a recurring feature of medicine in the 1940s, particularly towards the end of the Second World War, when, as Nancy Scheper-Hughes argues, starvation suddenly appeared as a spectre haunting white Europeans rather than distant natives, with fearful implications for the post-War world.[39] In this period, there was a marked increase in 'hunger studies', from the Far East to the Mid-West. In Japanese prisoner of war camps, for example, British medical officers took detailed notes on the physical effect of meagre diets.[40] During the siege in Leningrad, Russian doctors published a number of studies into the effects of starvation on health and psychology. [41] After widespread famine in 1944-45, the government of the

[39] Nancy Scheper-Hughes, *Death without weeping: the violence of everyday life in Brazil* (Berkeley: University of California Press, 1992), 130.
[40] These studies remained unpublished, but can be found in the Archives of the London School of Hygiene and Tropical Medicine, NUT/11/03, NUT/11/08, NUT/11/09, and NUT/11/10, London, UK.
[41] J. Brozek, S. Wells, and A. Keys, 'Medical aspects of semistravation in Leningrad (siege 1941-1942)', *American review of Soviet medicine* 4, no. 1 (1946); Lisa Kirschenbaum, *The legacy of the siege of Leningrad, 1941-1995* (Cambridge: Cambridge University Press, 2006), 42-76; Pavel Vasilyev, 'Alimentary and pellagra psychoses in besieged Leningrad', in *Food and war in twentieth century Europe*, ed. Ina Zweiniger-Bargielowska, Rachel Duffett, and Alain Drouard, (Farnham: Ashgate, 2011).

Netherlands commissioned an official report covering the causes, consequences and medical lessons of the crisis.[42] These studies covered similar ground, documenting the symptoms of starvation and its catastrophic effect on the body. In this section I focus on two of the more well-known and widely cited World War Two starvation studies, which illustrate the kind of intricate detail they all contained. The first took place in Warsaw, and the second in Minnesota.

The Warsaw hunger studies

The first starvation studies of World War Two took place in the Warsaw Ghetto, after it was sealed in 1941. Food for the Jewish population was restricted to 300 kilocalories per day, and as the ghetto was overcome with emaciated and oedematous bodies, a group of Jewish physicians decided to study the effects of extreme hunger. What were later published as studies of 'hunger disease' featured papers written by specialists in ophthalmology, metabolism, pathology, paediatrics and the circulatory system, based on hundreds of clinical examinations, and thousands of autopsies. The study only lasted six months, but the level of detail remains astounding.[43] In the words of one commentator, 'nothing was too obscure or too trivial, nothing was overlooked in the investigator's search for descriptions of the course of starvation'.[44] The expert in circulatory system injected dye into the patients'

[42] J. Drummond, H. R Sandstead, and G. C. E Burber, *Malnutrition and starvation in western Netherlands* (The Hague: Allied Forces Supreme Headquarters. Netherlands Mission., 1948). See also Zena Stein, *Famine and human development: the Dutch hunger winter of 1944-1945* (London: Oxford University Press, 1975). Also in Western Europe, studies of starvation in Dachau and Bergen-Belsen yielded a number of academic papers. See Henri Rosencher, 'Medicine in Dachau', *British Medical Journal* 2, no. 4485 (1946); Lipscomb, 'Medical aspects of Belsen concentration camp'; P. L. Mollison, 'Observations on Cases of Starvation at Belsen', *British Medical Journal* 1, no. 4435 (1946).
[43] The study took place from February 1942 until the first wave of deportations from the Warsaw Ghetto in July that year. For more, see Charles Roland, *Courage under siege: starvation, disease, and death in the Warsaw Ghetto* (New York: Oxford University Press, 1992). Leonard Tushnet, *The uses of adversity* (New York: Yoseloff, 1966). Myron Winick, 'Preface', in *Hunger disease: studies by the Jewish physicians in the Warsaw Ghetto*, ed. Myron Winick, (New York: Wiley, 1979).
[44] Tushnet, *The uses of adversity*, 51.

arteries, retrieving blood with a second needle in order to examine its rate of return.[45] The ophthalmologist examined the intraocular pressure of the eye, using a primitive tonometer that placed weights on the eyeball.[46] Other physicians injected insulin and iron into patients' arms in order to see their effect on metabolism.[47] Bone marrow was extracted with a needle and examined; salt water was injected under the skin to see how long the resulting blisters remained.[48] The heart and circulation were examined by getting patients to do sit-ups, or by giving them hard-boiled eggs and measuring the response of their blood pressure to protein and exercise.[49]

These experiments revealed the effects of starvation with terrifying precision: the reduction in body temperature, the weakness, the low red blood count, the skin pigmentation, the malfunction of the sweat glands, the abnormal hair growth, the slowing of circulation, and the irritability and lack of energy. Each observation was supported by a mass of data, and built up a clinical description of hunger, which, in the opinion of some scholars, has not been bettered.[50] But reading through the studies leaves a horrific impression, mainly because this was part of a wider policy of extermination, but also because the Jewish physicians were left impotent, completely unable to do anything to help the starving. It seems a terrible subversion of the doctor's role that they were incapable of caring for their patients, powerless to fulfil their basic roles, left feeling that they could achieve most by conducting ghoulishly

[45] Emil Apfelbaum, 'Pathophysiology of the circularatory system in hunger disease', in *Hunger disease: studies by the Jewish physicians in the Warsaw Ghetto*, (New York: Wiley, 1979), 131-54. This technique was almost certainly based on John Gibson and William Evans, 'Clinical studies of the blood volume', *The Journal of Clinical Investigation* 16, no. 3 (1937).
[46] Szymon Fajgenblat, 'Ocular disturbances in hunger disease', in *Hunger disease: studies by the Jewish physicians in the Warsaw Ghetto*, ed. Myron Winick, (New York: Wiley, 1979), 200-05.
[47] Julian Fliederbaum, 'Metabolic changes in hunger disease', in *Hunger disease: studies by the Jewish physicians in the Warsaw Ghetto*, ed. Myron Winick, (New York: Wiley, 1979), 77. Michal Szejnman, 'Changes in peripheral blood and bone marrow in hunger disease', in *Hunger disease: studies by the Jewish physicians in the Warsaw Ghetto*, (New York: Wiley, 1979), 183.
[48] 'Changes in peripheral blood and bone marrow in hunger disease'. Anna Braude-Heller, Israel Rotbalsam, and Regina Elbinger, 'Clinical aspects of hunger disease in children', in *Hunger disease: studies by the Jewish physicians in the Warsaw Ghetto*, ed. Myron Winick, (New York: Wiley, 1979), 49. The blister experiment is known as the Aldrich McClure skin water test.
[49] Apfelbaum, 'Pathophysiology of the circularatory system in hunger disease', 142-3.
[50] Winick, 'Preface'.

detailed research on the nature of starvation. The experiments they conducted were also cruel by today's standards, producing uncomfortable images of emaciated people struggling to exercise, subjected to injections, their internal workings illuminated by needles and dye; the imaginative possibilities of this situation have been drawn out by Sherman Russell, who, in her fictitious enactment of a scene in the hospital, presents the research as a search for meaning amongst doctors and patients:

> One more sit-up, the doctor's coaxed. One more needle. And from that, they promised, might come some meaning from this horror… In our imagination, the woman on the hospital bed tried to understand. She might even feel reassured by this bit of meaning accomplished in fifteen sit-ups. What does it matter if she spends her last hoard of energy and lives a few minutes less? She is hungry for meaning too.[51]

Russell's romanticism is undermined by the clinical text of the physicians' reports, which speak of the 'negative attitude' of the patients, the need for more 'goodwill and concentration'; it is also undermined by the significant risks involved.[52] There is no evidence to suggest the patients sought sense from the horror; indeed, it is a flight of the imagination to suggest that they were entirely willing participants in these experiments at all. Posterity, however, was certainly a motivational factor for the doctors. The experiments have been widely interpreted as a bid for immortality, an attempt to extract something positive from the situation. Unable to help their patients, unable to resist the Nazis, the doctors sought meaning in 'the reality of their grim, everyday life.'[53] Where the Nazis created only destruction, the Jewish physicians

[51] Sharman Apt Russell, *Hunger: an unnatural history* (New York: Basic Books, 2005), 104.
[52] Fajgenblat, 'Ocular disturbances in hunger disease'. Winick, *Hunger disease*, 155. 'Some of the techniques', he dryly observed 'were not without risk to the patient'.
[53] Israel Milejkowski, 'Introduction', in *Hunger disease: studies by the Jewish physicians in the Warsaw Ghetto*, ed. Myron Winick, (New York: Wiley, 1979), 4.

produced a monument of knowledge. In this reading of the situation, their research was a powerful form of resistance.

The initiator and coordinator of the research, Israel Milejkowski, stressed this clearly in his introduction to the text, explaining how the study aimed to extract a lasting scholarly contribution from the starving bodies that filled the hospitals.[54] The research, he emphasised, was carried out over a period of just six months, in which the doctors were aware that the ghetto could be destroyed and emptied at any moment; as a result, it has been widely interpreted as a product of 'heroic human endeavour', evidence of 'courage under siege', and a form of struggle, in which knowledge triumphs in the 'face of adversity'.[55] The aim, in Tushnet's words, was that 'research conducted in the shadow of death should become part of the immortal body of knowledge', and Dr. Milejkowski reflected these themes of endurance, resistance, and immortality in the closing paragraph of his paper.[56] Addressing colleagues, many of whom had already become victims of the death camps, he wrote: 'and you, Jewish physicians, you deserve some words of recognition… You, too, were menaced by forced labour, starvation, deportation, by all the forms of death that stalked our ghetto. And you gave the murderers a bold answer with your work – 'non omnis moriar' [I shall not wholly die].[57]

It is easy to see why a positive light should be placed on this appalling story, but the 'hunger disease' studies can also be read as something more sobering: as witness not to resistance, but the failures of resistance, as evidence not of the value of science, but its limitations. The story is so awful because the hunger was inflicted on the Warsaw ghetto intentionally, cruelly, as part of a fascist policy of extermination,

[54] 'Introduction'.
[55] Winick, *Hunger disease*, 4, 66; Roland, *Courage under siege*; Tushnet, *The uses of adversity*.
[56] *The uses of adversity*, 9.
[57] Milejkowski, 'Introduction', 5. This particular translation is taken from Tushnet, *The uses of adversity*, 96. The Latin is from Horace's Ode 3.30: *Non omnis moriar multaque pars mei vitabit Libitinam*. [I shall not wholly die and the greater part of me shall avoid the goddess of death].

to which there *was* no effective resistance. Medical research was no substitute, failing to provide any respite from the starvation; science could not help the patients, and its technical instruments were of no immediate use. One of the saddest and most poignant moments in the papers is the physician who, after undertaking failed experiments with iron injections and the addition of raw animal blood to meagre salads, concludes that results could only be achieved 'by supplying adequate nutrition and food with an appropriate calorific value'.[58] This, of course, was something that the doctors, with all their technical expertise and measuring instruments, were completely unable to do.

If there is an enduring value in the studies of 'hunger disease', it is as a political monument rather than as a scientific one. The papers live on not as a testament to scientific endeavour, but as a document of atrocity, a form of testimony in the political sense. The great irony of the studies was that this starvation was not a disease; it was a crime. Medicine had little to contribute, since the situation had a political cause and could only be tackled by a political solution. The focus on medical detail led not just to a profound misnaming of the situation, designating disease where there was injustice, but also revealed the severe limitations of a response that focused on individual pathology. The irony, in other words, was a situational one: it lay in the tragic discrepancy between expectations and reality, between the belief that scientific research would produce something positive, and the crushing reality that science could not help, and would never be able to help, in a situation such as this.

[58] Szejnman, 'Changes in peripheral blood and bone marrow in hunger disease', 185.

The Minnesota starvation experiment

There was no link to testimony in the most prominent starvation study from this era, which has become known as the 'Minnesota starvation experiment'. This took place between November 1944 and December 1945, and was led by Ancel Keys – a nutritionist who later became famous for developing the 'K-ration' for the American military. In this period, thirty-two volunteers came to live in the University of Minnesota, and were given a uniform, accommodated in a shared dormitory, and subjected to regular examinations accompanied by requirements to exercise. These volunteers were conscientious objectors from the historic peace churches of the United States – Quakers, Mennonites, and the Church of the Brethren – who undertook the work as part of their compulsory citizen service for the US government.

The experiment began with a three-month control phase, in which the participants were given an adequate but precise diet, and had their metabolism, physiology, and psychological health tested under what were considered to be 'normal conditions'. This was then followed by a starvation phase, where, for six months, they were given a diet of just 1,560 kilocalories per day and asked to undertake a set amount of exercise that would exceed their calorific intake. The final, rehabilitation, phase lasted for five months, during which the participants were each given a recovery diet, which was varied for comparison. The aim of the project was to create a laboratory simulation of famine, in an attempt to understand how civilians in post-War Europe would be affected by food shortage. As a result, the meals given to the volunteers resembled a poor European diet: dominated by cabbage, potatoes, and turnips.[59]

[59] For background on this study, see Leah Kalm and Richard Semba, 'They starved so that others be better fed: remembering Ancel Keys and the Minnesota experiment', *Journal of Nutrition* 135, no. 6 (2005); Todd Tucker, *The great starvation experiment: Ancel Keys and the men who starved for science* (Minneapolis: University of Minnesota Press, 2007).

The result of the study was a massive, two-volume work, running to 1,385 pages.[60] It documented the physical and psychological changes in the volunteers, and recounted the elaborate experiments, anatomical changes and emotional responses in detail. The volunteers were expected to walk two miles a week and expend 3000 kilocalories a day; they also had to undertake exercise whilst being examined. As they starved, a fascinatingly intricate regime of observation was enacted on the volunteers. This included anthropometry, X-rays and fluoroscopes, examining the outside as well as the inside of the body. It included biochemical analyses of urine, semen, stool, blood, and gastric juices on a regular basis. It included the dye injection technique, which was used to examine the circulation, and new contraptions to measure the venous pressure and respiration, which were inserted into the veins and over the head. It included testing the hearing, by playing different frequencies in a soundproof room, and testing vision under flickering lamps. It also extended to intelligence and coordination tests, which used the US Army General Classification technique and involved quizzing and examining fine motor skills by asking volunteers to complete tasks using children's toys. [61]

But the section on psychology and behaviour provides the most vivid account of the project, quoting extensively from the diaries of the participants and the psychological assessments of experts. The first effects of starvation were minor and quirky, including playing with food, creating 'weird and distasteful concoctions' in order to create an illusion of variety, and an obsession with collecting recipes and cookbooks. This later gave way to behaviour that strained social relations, such as fatigue, irritability, a desire for seclusion, 'outbursts of temper', and 'periods of sulking'. All participants complained of feeling cold, even in the middle of summer,

[60] Keys et al., *The biology of human starvation*.
[61] These techniques are explored most concisely in the methods section of the final report. *The biology of human starvation*, 1071-150.

and they began to get depressed: 'what humour remained at the end of semi-starvation was mainly of the sarcastic variety'.[62]

Then more serious reactions emerged. These were classed by the researchers as being neurotic or psychotic, and often attributed to pre-existing mental health problems or a failure of discipline. The profiles of the worst affected men read like character assassinations, couched as psychological flaws rather than a natural response to the cruelty of the experiment. One man is summarised as a 'bisexual individual with poor personality integration and weak self-control'. Another is diagnosed with 'clinical neurosis', characterised by 'indecisiveness, self-deprecation, feelings of guilt, restlessness, nervous tension, compulsive gum-chewing and eating off-diet'. Another was affected so badly that he exhibited 'fits of 'hysteria', 'violent outbursts', and ended up mutilating himself, chopping off three fingers with an axe in an attempt to get discharged from the project.[63] The effect on the participants was huge: of the 40 original volunteers, eight dropped out with severe trauma and many others experienced depression.

The Minnesota starvation experiment was one of several scientific studies that made use of American conscientious objectors during World War Two, who, by law, had been required to undertake citizen service. Many of these volunteers were sent to remote work camps, aiming to keep them secluded so they could not spread their pacifist philosophy. They were often tasked with rural jobs such as fighting fires or working on farms, but others were isolated by work in asylums, or employed as 'human guinea pigs' in a variety of scientific studies. This component of the civilian service programme was instigated because, as Laura Stark put it, 'the great virtue of religious objectors was that they were healthy, pliant and cheap'.[64] The starvation

[62] *The biology of human starvation*, 832-38.
[63] *The biology of human starvation*, 880-900.
[64] Laura Stark, *Behind closed doors: IRBs and the making of ethical research* (Chicago: University of Chicago Press, 2012), 94.

experiment was by no means the most unpleasant: other experimental tasks included being wrapped in wet blankets in cold conditions, wearing lice infected underwear, living in decompression chambers that simulated high altitudes, and being infected with hepatitis by swallowing the body waste of infected patients.[65] The Civilian Public Service appears to have been punishing or humiliating the conscientious objectors, but the idea, for its proponents, was to ask for their sacrifice to be similar to the armed forces. This involved not only putting them to challenging, stressful tasks, but also developing their sense of duty, which they had to prove through suffering.

This stress on sacrifice is important, because the Minnesota starvation experiment was justified by the belief that it would lead to progress and human advancement. The volunteers signed up to the project to make a sacrifice for humanity, and many reiterated years later that they would do the same again.[66] The theme was emphasised in contemporary publicity for the project, which asked volunteers 'will you starve that they be better fed?'; it also underpinned scholarly commentary on the experiment, which presented this as a remarkable feat of science. These themes – of sacrifice and scientific steadfastness – are reminiscent of the Warsaw ghetto experiments and indicate that there was a robust modernism underpinning the 'hunger studies'. Suffering was presented as an opportunity, a chance for meaning to emerge from misery. The study participants were presented as courageous and noble, the scientists as driven and determined. It was a positive, redemptive narrative, which placed faith in the accumulation of knowledge, and valorised the heroism of 'the men who starved for science'.[67]

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[65] Steven Taylor, *Acts of conscience: World War II, mental institutions, and religious objectors* (Syracuse: Syracuse University Press, 2009), 73-103; Nicholas Krehbiel, *Lewis B. Hershey and Conscientious Objection during World War Two* (Columbia: University of Missouri Press, 2012), 8-9; Russell, *Hunger*, 119-20.
[66] Kalm and Semba, 'They starved so that others be better fed'.
[67] This phrase comes from Tucker, *The great starvation experiment: Ancel Keys and the men who starved for science*.

Implications for anthropometry

In chapter four I recounted the rumour circulating amongst UNRRA relief workers after World War Two, which concerned the arrival of a miracle cure for starvation, a nutritional equivalent of DDT.[68] This 'wonder drug' was almost certainly protein hydrolysates: pre-digested proteins in liquid form, which were being administered in Belsen through injections and gastric tubes. To describe this experimental treatment as a 'miracle cure' was pure optimism, but the rumour encapsulates a dominant, modernist belief: that improvement might arise from the ruins of war.[69] Such a belief underpinned all the hunger studies. From the Leningrad siege to the Dutch Hunger Winter, there was a resilient faith that some good could come from suffering. At the root of these experiments was the belief that intricate anatomical information on starvation could help extract something worthwhile from political and social failure. In some ways, this was a necessary fiction: there could be little justification for experimenting on other people's pain without a redemptive idea of human progress.

With the benefit of hindsight, however, we can see that the starvation studies had little impact on humanitarianism. To echo Guy Baily's criticism of the kwashiorkor literature, the 'minutiae of reductionist knowledge' made a miniscule contribution to the practical problems of relief.[70] Neither the Minnesota nor the Warsaw experiments had much effect on post-war assistance: of the 1,385 page Minnesota study, only five pages were devoted to re-feeding and rehabilitation (which contained no firm guidance for relief workers), and the Warsaw ghetto studies were

[68] Smith, *Dachau*, 208.
[69] Shephard, 'The medical relief effort at Belsen', 42; Vernon, *Hunger*, 148.
[70] Golden has also argued that the growth of scholarly attention towards starvation in the 1940s provided little concrete guidance for managing malnutrition. Golden, 'The Development of Concepts of Malnutrition', 2121.

not even published in English until 1979.[71] Many more pages were devoted to emotional responses to starvation, and a 'psychological manual for relief workers' was published in 1946 on the back of the Minnesota experiment, but this manual failed to reveal anything beyond the depression, humourlessness, irritability, and self-absorption that had long been recognised as symptoms of persistent hunger.[72]

Instead, the effect of the starvation studies on humanitarian practice can be found more remotely. In searching for the physiological details of starvation, these 'hunger studies' reinforced what is now a dominant view: that malnutrition took place deep inside the physique. The autopsies, fluoroscopes, x-rays, and extraction of bone marrow, the injections of iron and insulin to examine metabolism; the laboratory tests on urine, semen, and stool were all designed to find out what happened underneath the body's visible exterior. They contributed to the idea that malnutrition was a biochemical process, occurring at the cellular level: something invisible, internal. These detailed experiments produced a perspective on malnutrition that was principally physical, defining it as a situation where nutrients were unavailable for the body's needs, such that the cells ceased to function.[73]

This was an important foundation for nutritional anthropometry because it produced a corporeal view of hunger, which was defined and accessed by scientific measurement. It generated an idea of a 'pure', 'true', biochemical malnourishment, which was objectively definable by experts and unidentifiable by the sufferers themselves. The approaches used in the hunger studies were not practical for humanitarian emergencies, so humanitarian agencies required a quicker and easier

[71] The full text of the Minnesota report was not published until 1950, although some of the results of the Minnesota experiment were made available in 1945. See Ancel Benjamin Keys, "Experimental starvation in man," (Minneapolis: University of Minnesota, 1945).
[72] These observations were developed into a relief workers manual: Harold Steere Guetzkow and Paul Hoover Bowman, *Men and hunger: a psychological manual for relief workers* (Elgin: Brethren publishing house, 1946). However, it doubtful that this was ever used by UNRRA.
[73] Malnutrition usually means obesity as well, but for the purposes of this thesis I am using it to refer to undernourishment.

technique. This is where anthropometry fitted in. It was based on the same intellectual foundations as the hunger studies, but it offered a 'quick and dirty' way for making malnourishment visible. With anthropometry, hunger was still defined as a biochemical imbalance, but there was now a more practical way of revealing it. Anthropometry became a proxy indicator for the underlying, biochemical malnourishment. Since disaster situations have no laboratories for detailed biochemical testing, anthropometry emerged as a way of measuring hunger on the exterior of the body, rather than its interior.

Anthropometry was never meant to define malnourishment. It could be used to *indicate* it, but it was never meant to diagnose when someone was malnourished.[74] Guidelines for anthropometric screening emphasise that there remains a clear division between the underlying *fact* of malnourishment, and its surface, corporeal manifestations. The 'actual' or 'factual' malnourishment takes place in cells and through nutrients: at the biochemical level. Anthropometry just measures the secondary effect of these interactions on the physique. The guidelines for anthropometry clarify that it is quite possible for someone to be small, underweight, and in the anthropometric zone of malnourishment, but not to be 'actually' malnourished. Conversely, someone might measure as normal and be above the cut-off point of malnutrition, when one is, 'in fact' malnourished.[75]

[74] In what follows, as in the rest of the thesis, I am speaking about anthropometric screening in emergencies. My arguments should not be taken to apply to other uses of anthropometry, for example when used in surveys to measure the overall nutrition of the population.

[75] 'If the lower bounds of normal variation were set so low as to exclude all cases of healthy small size, much actual malnutrition would not register. In order to obtain a reasonable degree of sensitivity, cut-offs are set high enough that a small proportion of individuals fall below them, despite good health and adequate nutrition. At the same time, some who are naturally larger fall above the cuts-offs, even when they are, in fact, malnourished.' Sara Millman and Laurie DeRose, 'Measuring Hunger', in *Who's hungry? And how do we know? Food shortage, poverty, and deprivation*, ed. Laurie Fields DeRose, Ellen Messer, and Sara Millman, (New York: United Nations University, 1998), 38.

Implications for theory

In chapter three, I looked at Annemarie Mol's philosophy of multiple ontologies.[76] For Mol, every object is multiple. There are no singular objects, sitting in the external world, to which we come to gain partial knowledge. Instead, every object is multiple; it is fractured by the different techniques we use to know it. In chapter three, I contrasted this with social constructivism, which suggests that there *are* single objects out there, but they are viewed from many different perspectives. The implication of social constructivism, I argued, is that the objective existence of the object can never be finally known: since every perspective is partial, distorted, and mediated through language, it becomes impossible to pin down the external object with any final certainty. This is fine in some contexts – when speaking of race, for example – but it seems to trivialise other objects like hunger. [77] Hunger is absolutely, painfully material. It seems rather nihilistic to insist it is a social construction. Of course, it has social manifestations, but we cannot ignore its materiality, because for those who suffer it remains horrifically, agonizingly real.

Mol's point is distinct from this social constructionist perspective. For her, objects like hunger are not socially constructed, but produced by social *and* material networks. They are not singular things, viewed from multiple perspectives: they are multiple, fractured into many different objects. To think of hunger in this way does not trivialise it, reducing it to discourse or perception, because it actually makes hunger *more* real. Whereas social constructivism makes hunger more and more diffuse with every distorting perspective, leaving its material reality trivialised, Mol's approach makes hunger more real, more concrete, and more material as it multiplies into many forms.

[76] Mol, *The body multiple*. See also chapter three.
[77] Ian Hacking, *The social construction of what?* (Cambridge: Harvard University Press, 1999).

How might this idea be applied to anthropometry? It would suggest that each way of seeing hunger produces a new object, a new form of malnourishment. It would suggest that malnourishment is multiple, produced by the different attempts to measure it. It would insist that there is no one, final, true malnourishment, which sits in the external world, deep inside the physique, waiting to be uncovered by the scientist. It would suggest, instead, that anthropometry produces just one kind of malnourishment, whereas other mechanisms for measuring hunger produce other kinds: clinical observations, for example, or biochemical tests.

In other words, each way of measuring malnourishment is not a different view of the same, 'true' malnourishment that lies behind them. They are three distinct objects. It makes no sense to distinguish a 'true' theoretical biochemical hunger from the anthropometric measures that indicate this underlying condition because in the end, all we have are the practices that make the phenomenon visible. Anthropometry, despite the claims of users, does not just indicate an underlying, biochemical malnourishment; it produces its own malnourishment. It makes for a different kind of hunger.

What is interesting about this theory is that nutritionists would probably agree. Even if they were conceptually wedded to the idea of a 'true', biochemical malnourishment, they would recognise it as rather abstract, and, to all practical purposes, redundant. 'True' malnourishment cannot be measured, and so it may as well not exist. When a nutritionist in Yusuf Batil measures a child, for example, she does not ever make abstract declarations such as: 'this red MUAC score is just an *indication* of malnourishment, which can never be fully known, because malnutrition is an invisible process that takes place in the biochemistry of the body.' The nutritionist simply takes a red MUAC reading, and declares the child to be

malnourished – and, hopefully, directs them to some easily digestible food as quickly as possible.

Hunger, then, is *produced* through practice; its very definition is created by the techniques that make it visible. Most importantly, the various methods of 'revealing' malnourishment produce a different kind of hunger. And as I have indicated, anthropometry is not the only way of 'seeing' malnourishment – there are several others, which can be divided into 'input' and 'outcome' types.[78]

Input approaches are based on the idea that we can examine what people are eating, and determine whether this is enough for their needs. In this approach, *diet* is analysed, not the body itself. The surveyor might, for example, give households a form to record what they eat each day, they might look at the food available in local markets, or they might practice 'child following' (shadowing children and noting everything that passes their lips).[79] In such surveys, hunger is defined by insufficient intake of nutrients. Hunger occurs when the nutritional content of the diet is insufficient to meet declared daily requirements. The surveyor will monitor what someone eats, or what the household buys, and calculate the nutritional value of this diet. If this method reveals an intake of 1000 kcal a day, for example, they will declare the person to be malnourished, because in comparison with a chart of nutritional requirements, 1000 kcal indicates a considerable shortfall. Hunger, in this reading, is the insufficient intake of nutrients over the course of the survey, defined against recommended allowances.

'Outcome' approaches look at the other end of the biological process: the effect of diet on the body. These do not examine what people have eaten, but what happens as a result. We have already discussed anthropometry, but other outcome

[78] This division can be found in many publications, with perhaps the best explanations in Jelliffe and Jelliffe, *Community nutritional assessment*, 13-126; Millman and DeRose, 'Measuring Hunger', 21-46; Jelliffe, *The assessment of the nutritional status of the community*, 10-94.
[79] Millman and DeRose, 'Measuring Hunger', 29. For a particularly good description of the perils of survey methods, see Vernon, *Hunger*, 130-31.

methods include biochemical tests (which usually measure the protein in the blood) and clinical methods (which look for the presence of oedema, dermatitis, or other external signs).[80] Each of these methods produces a different kind of hunger. If we use the biochemical method, we might take a blood sample and send it off to the lab to be tested. When the results come back, we then compare the results to a chart. Hunger is defined by the presence or absence of nutrients in the body: according to some tests it is defined when the serum transferrin is less than 0.45mg per ml of blood; according to others it is defined by the level of serum albumin, or the ratio of amino acids.[81] Hunger, in this reading, is not defined by the foods eaten, but by the biochemistry of the blood. If the blood reveals an insufficient presence of certain chemicals, according to established cut-off points, the subject can be declared as malnourished.

Another outcome approach is the clinical method. If we use these techniques, hunger is determined by a set of signs and symptoms. It might be seen when the hair falls out, when there are patches of hardened skin, or when oedema is found in the legs. We might press our thumbs on their calves to test for a watery swelling, or examine someone's skin for dermatitis. On the basis of these signs, and the symptoms of the patient, we diagnose a person to be malnourished. Hunger, in this reading, is not defined by the foods eaten, or the biochemistry of the blood: it is determined by the presence or absence of signs observed on the body's exterior.

In each of these cases, hunger is a different object, a different thing. These are not several ways of viewing a single, conceptual object, which may be combined to approximate a truth. These methods *produce* malnourishment; they enact

[80] Jelliffe, *The assessment of the nutritional status of the community*, 10-49, 78-94.
[81] H. McFarlane et al., 'Biochemical assessment of protein-calorie malnutrition', *The Lancet* 293, no. 7591 (1969): 394; J Metcoff, 'Biochemical Effects of Protein-Calorie Malnutrition in Man', *Annual Review of Medicine* 18, no. 1 (1967); Donald McLaren, 'A fresh look at anthropometric classification schemes in Protein-Energy Malnutrition', in *Anthropometric assessment of nutritional status*, ed. John Himes, (New York: Wiley-Liss, 1991), 277.

malnourishment differently. In anthropometry – the main focus of this thesis – hunger is defined by body shape. It is declared when the weight for height is less than three standard deviations from the mean, or when the MUAC is smaller than 11.5cm.[82] Anthropometry comes in many different types, but the process is always similar: we take some measure of the body and then compare this with the equivalent dimensions in a healthy reference population. If the measurement falls at the lower end of the distribution, it is presented as an indication of malnourishment. However, in practice, this is more than just an indication: it also defines hunger. In humanitarian emergencies, we *declare* a child to be malnourished when they have a MUAC that is smaller than 11.5cm or when we find a weight-for-height score lower than three standard deviations from the mean. We use this to begin a nutritional intervention.

Conclusion

This chapter has described the medicalization of hunger and the accumulation of detail into the physiology of starvation. It argued that this concern for specifics was an important pre-requisite for the rise of nutritional anthropometry.[83] In the first section of this chapter I looked at the story of kwashiorkor, suggesting that this is a good example of changing approaches to hunger. I looked at how Cicely Williams adopted a local term for this disease, whilst transforming its meaning. She stripped it of its social connotations, turning it from a social situation to a nutrient deficiency; she gathered detail on the physical manifestations of the disease, conducting autopsies and finding fatty livers; this then made the disease amenable to a set of technical interventions, leading to the rise of fortified flours as the 'great protein fiasco' The

[82] Perhaps the most nuanced description of the anthropometric methods and its cut-off points can be found in Jelliffe and Jelliffe, *Community nutritional assessment*, 56-127.
[83] The second intellectual foundation for anthropometry is statistics, which is considered in the next chapter.

story of kwashiorkor, I argued, demonstrated a shift of attention from external to internal characteristics. Drawing on Foucault's work on the birth of the clinic, I suggested that the medicalization of hunger involved a similar transformation: it was no longer seen as an external visitation, rooted in wider conditions; it became internal, specific, and part of man's lyrical core.

The second part of this chapter turned to further examples of hunger's medicalization. Recounting the 'hunger disease' studies in the Warsaw Ghetto and the Minnesota starvation experiment, I showed the intricate level of detail in which starvation became examined. From injecting dye into patient's blood, to testing the pressure of their eyeballs and making psychological assessments of their conduct, there was no facet of starvation that went unmeasured. I argued that this accumulation of detail had very little impact on the practical work of humanitarianism, since the cure for starvation was by then well known: feeding people small amounts of easily-digestible food at regular intervals. They did, however, have a less direct impact, creating the conditions for nutritional anthropometry. By restricting hunger to a biochemical condition, taking place deep inside the physique, such experiments allowed anthropometry to emerge as a proxy indicator. Anthropometry could claim to reveal what was otherwise difficult to see, acting as a gauge for true, biochemical malnourishment, which was an invisible interaction between cells and nutrients.

The core argument in this chapter is that each way of making hunger visible is a construction, producing the object it seeks to find. Despite the many attempts to devise a typology of starvation, 'true' hunger would remain out of reach. Anthropometry produced an anthropometric hunger and biochemical tests produced a biochemical hunger: each was an attempt to create order out of the messiness of the world.[84] Again, most clinicians would probably concur: as early as 1959, Derek

[84] As John Law argued with respect to all research methods, the methods of measurement produce the order they seek to find. Law, *After method: mess in social science research*.

Jelliffe criticised the simplistic notion that there were just two forms of starvation: marasmus, which was caused by a lack of energy (leading to wasting), and kwashiorkor, which was caused by a lack of protein (leading to oedema). Conditions of malnutrition, Jelliffe argued, are a complex combination of energy and protein deficiencies, leading to a 'kaleidoscopic and bewildering variety of clinical pictures, which are often difficult or impossible to classify'.[85] Kwashiorkor, it turned out, was a rather simplistic way of creating order out of chaos. By the late 1950s it may have generated widespread acceptance and become relatively stable, but it was a construction: a human attempt to create order out of the complexity of nutritional problems.

In the 1960s there were a number of more refined attempts to fashion a system from this kaleidoscope of clinical pictures. In the early 1950s, the simple, bipolar designation of marasmus and kwashiorkor was replaced by a continuum, with kwashiorkor at one end, marasmus at the other, and a combination of the two in the middle ('marasmic kwashiorkor').[86] By the 1960s, the 'Gomez classification' had become common, which focused on body weight, establishing a system for degrees of starvation that was linked to the normal distribution of weight-for-height in the population.[87] By 1969, the continuum and levels were both combined in a tabular representation of malnutrition known as the Wellcome classification, with the two main manifestations of starvation (wasting and oedema) structuring four different

[85] Jelliffe, 'Protein-calorie malnutrition in tropical preschool children', 242.
[86] Jelliffe D. B. Jelliffe, G. Bras, and K. L. Stuart, 'Kwashiorkor and marasmus in Jamaican infants', *West Indian Medical Journal* 3, no. 1 (1954).
[87] F. Gomez et al., 'Malnutrition in infancy and childhood, with special reference to kwashiorkor', *Advances in pediatrics* 7(1955); M. Gueri, J. M. Gurney, and P. Jutsum, 'The Gomez classification: time for a change?', *Bulletin of the World Health Organization* 58, no. 5 (1980). The Gomez classification was first adopted in 1946 in the Hospital Infatil de Mexico 'to simplify the nomenclature of a large group of diverse and confusing ailments, the common basis of which is deficient nutrition'. McLaren, 'A fresh look at anthropometric classification schemes in Protein-Energy Malnutrition', 275. This divided malnourished children into 'degrees': 'normal', mild (1st degree), moderate (2nd), and severe (3rd), based on % of expected weight for age.

categories of malnourishment.[88] Yet all these attempts are constructions, they are all human attempts to create a system of order. Just like kwashiorkor, they were made, not discovered. This should not be taken to mean that they are not real – as Latour has been at pains to point out, things that are constructed still exist – but it does help show how they fail to capture the multifaceted nature of malnutrition. Their aim is to simplify, to orientate towards practice, to structure the complex, kaleidoscopic clinical picture into something that can be acted upon. They are, in the end, evidence of Latour's central point: that hunger, like every object, is multiple. It is produced by its intricate relations, and ultimately irreducible to these relations.

[88] Waterlow, *Protein-energy malnutrition*, 3-6.

8.

The end of alpha and omega

Statistics, universality, and ideas of normality

In the first half of the twentieth century, anthropometry was a popular scientific method. There was a sense that the body could reveal something important about the person, and that human characteristics could be 'read' on the physique. In criminology, for example, facial features and cranial size were used to identify a degenerate class of delinquents.[1] In public health, body size was used to reveal poor sanitation and living conditions.[2] In anthropology, surveys of body shape became a way of dividing human beings into racial groups.[3] Travelling around the world to study 'native' peoples, many anthropologists returned with a survey of physical appearance, including skin colour, eye colour, height, and head size.[4]

These measuring techniques looked rather similar on the surface, but they represented radically different ideas about humanity. In 1939, two books were published that illustrate the different intellectual underpinnings for anthropometry. First, there was Carlton Coon's *The Races of Europe,* a massive, 700-page tome of physical anthropology, which contained a description of every European ethnic group

[1] This was often known as *bertillonage*, after Alphonse Bertillon. Nicole Hahn Rafter, *The origins of criminology* (Abingdon: Routledge, 2009), 220-35. Quetelet was also involved: Piers Beirne, *Inventing criminology: essays on the rise of homo criminalis* (Albany: State University of New York Press, 1993), 65-110. Piers Beirne, *The origins and growth of criminology: essays on intellectual history, 1760-1945* (Aldershot: Dartmouth, 1994); Neil Davie, 'Criminal Man Revisited? Continuity and Change in British Criminology, c.1865–1918', *Journal of Victorian Culture* 8, no. 1 (2003); Josh Ellenbogen, *Reasoned and unreasoned images: the photography of Bertillon, Galton, and Marey* (University Park: Pennsylvania State University Press, 2012).

[2] J. M. Tanner, *A history of the study of human growth* (Cambridge: Cambridge University Press, 1981); Reynaldo Martorell, 'Notes on the history of nutritional anthropometry', *Federation Proceedings (Journal of the Federation of American Societies for Experimental Biology)* 40, no. 11 (1981).

[3] Rachel Caspari, 'From Types to Populations: A Century of Race, Physical Anthropology, and the American Anthropological Association', *American Anthropologist* 105, no. 1 (2003): 65; Douglas Lorimer, 'Theoretical Racism in Late-Victorian Anthropology, 1870-1900', *Victorian Studies* 31, no. 3 (1988).

[4] A lovely account of the opposition to craniometry can be found in Sven Lindqvist, *The skull measurer's mistake: and other portraits of men and women who spoke out against racism* (New York: New Press, 1997).

in Europe.[5] Coon used photography and anthropometry to document the physique and appearance of these groups, dividing the 'white race' into ten different types, from 'large-headed Palaeolithic survivors' to 'Brachycephalized Mediterranean derivatives'.[6] Much of Coon's work relied on cranial dimensions: he used 'special metal head-spanners' to produce the cephalic index – the width of the head, multiplied by 100 and divided by its length. He also recorded the height, chest diameter, and breadth of the shoulders.[7] Coon created a complex classificatory scheme from these measures, containing an explicit human hierarchy of intelligence and development. As late as 1962 he was claiming that humans could be divided into five sub-species, each of which evolved into *Homo Sapiens* at different times. His book *The Origin of Races,* for example, contained an image comparing an aboriginal woman with a Mandarin man, captioned: 'The Alpha and Omega of *Homo Sapiens*: an Australian aboriginal woman with a cranial capacity of under 1,000cc, and a Chinese sage with a brain nearly twice that size.'[8]

The second book was published by the League of Nations, entitled *Guiding Principles for Studies on the Nutrition of Populations*.[9] This was written by E.J Bigwood, and contained extensive guidelines for nutritional surveys. The intention of this book was to ensure nutritional data was collected in the same manner around the world, so that it could be compiled and compared. Amongst other methods, Bigwood set guidelines for anthropometry, recommending some similar anthropometric techniques to Coon: the height, head circumference, and chest circumference. These

[5] Carleton S. Coon, *The races of Europe* (New York: The Macmillan Company, 1939).
[6] *The races of Europe*, 291-96.
[7] *The races of Europe*, 241-45.
[8] Carleton S. Coon, *The origin of races* (London: Jonathan Cape, 1963), plate xxxii. For an excellent account of the controversy that accompanied this book, which can be seen as the death knell of the 'old physical anthropology', see John P. Jackson, 'In Ways Unacademical: The Reception of Carleton S. Coon's The Origin of Races', *Journal of the History of Biology* 34, no. 2 (2001); Caspari, 'From Types to Populations'.
[9] E. J. Bigwood, *Guiding principles for studies on the nutrition of populations* (Geneva: League of Nations Health Organisation, 1939). Bigwood's text emerged from a League of Nations conference on nutritional assessment in the early 1930s: its genesis can be found in the League of Nations Quarterly Health Bulletin, 1933.

were to be measured with special tools, such as height boards, skinfold calliper, and measuring tape. Later, in the 1960s, the World Health Organisation revised these guidelines and produced a new handbook written by Derek Jelliffe, which was a direct descendent of Bigwood's.[10] Whereas Bigwood's text required bulky equipment and complicated calculations, the emphasis in Jelliffe's was rapidity and simplicity. Like Bigwood, it contained a series of anthropometric measures including the skinfold measurement, and it was illustrated with diagrams that are still in use today.[11]

Bigwood and Coon may have written in the same period, and they may have used similar anthropometric procedures, but they represent a gulf in intellectual understanding. Measuring bodies to categorise people into races, and measuring to categorise them by nutritional status look very similar on the surface, but they emerge from fundamentally different assumptions about humanity. On the surface, both approaches appear to silence people, objectify them, classify them, and reduce them to a set of bodily measurements. Both approaches use invasive measurements, requiring stillness and cooperation as they submit people to an external gaze. Yet underneath the visible procedures, these bodily measurements represent almost polar ends of the intellectual spectrum. In Coon's hands, anthropometry was underpinned by the idea that humans are fundamentally different; in Bigwood's hands, it was underpinned by the idea that humans are fundamentally the same. The ubiquity of nutritional anthropometry, therefore, relied on an important intellectual shift: the demise of the first idea and the success of the second idea, the end of racism and the rise of 'universal man'.

[10] Jelliffe, *The assessment of the nutritional status of the community*. This book emerged from the 1963 report issued by the WHO 'expert committee on medical assessment of nutritional status'; Jelliffe's work was conceived as an elaboration on this report. For background, see Josep Barona, *The problem of nutrition: experimental science, public health, and economy in Europe, 1914-1945* (Oxford: Peter Lang, 2010), 50-56.

[11] See, for example, the more recent iteration of this handbook, which contains many similar images: World Health Organization, *The management of nutrition in major emergencies*.

Human universalism is one of two intellectual ideas I discuss in this, final chapter, which looks at a different kind of foundation for anthropometry. The last chapter looked at the power of specifics: the accumulation of detail on the deteriorating body, and the idea that malnourishment was a deep, underlying, biochemical condition that could be revealed with anthropometric techniques. This chapter looks at the power of statistics: the accumulation of data on body sizes which enable them to be compared with an empirical reference point and declared to be malnourished or not. This chapter, therefore, turns from the conceptual definitions of malnourishment to the more practical question of how anthropometry is operationalized. Making anthropometry work, I argue in this chapter, requires two related ideas. First, an idea of universal man – the powerful, egalitarian belief that all humans are fundamentally the same and can reasonably be compared – and second, the idea of normality – the statistical construction that establishes a cut-off point beyond which we declare a body size to be unacceptable from a moral as well as a nutritional point of view.

Universality and normality allow anthropometry to work. The first enables bodies to be compared with one another, and the second transforms a set of measurements into a standard for judgement. Yet my argument in this chapter is there is a clash, or incompatibility between these two preconditions for anthropometry. Although anthropometry is founded on a profoundly egalitarian basis – the triumph of nutritional anthropometry over its racist cousin – there is an embedded set of value judgements in the way it works, which prejudices some ways of life over others. Anthropometry holds up certain kinds of society to be emulated and it excludes others from its calculations. Underneath this seemingly simple, straightforward, scientific approach, therefore, is an iceberg of assumptions, which it is my aim to explore. In

line with the rest of the thesis, this chapter is designed to open up the 'black boxes' of humanitarian nutrition to see what goes on inside.

Universality

When children are measured in a place like Yusuf Batil, the idea of universality underpins the whole process. For humanitarians, it goes without saying that refugees are part of the same species as the aid workers. It is accepted that starvation can be judged by an independent criteria, applied to everyone, wherever they are in the world. Yet these seemingly obvious, unremarkable, assumptions were not always a given. In the 1930s, racist ideas still dominated physical anthropology, and were reflected in an anthropometry that sought to distinguish human beings into types. But by the end of the 1960s, these racist ideas had been widely discredited and the idea of 'universal man' had triumphed. Without this universalism – the turning point for which is usually located in the 1950 UNESCO statement on 'race and human difference' – nutritional anthropometry would be unthinkable. Universalism was an achievement that had to be fought for, not an inevitability to be taken for granted.

Taxonomy and plasticity

Coon and Bigwood are paradigmatic examples of these two approaches to anthropometry. Coon's anthropometry is based on the idea that humans can be divided into races, and that they have biologically determined essences that can be captured and measured. Bigwood's anthropometry is underpinned by the idea that humans are all part of the same species, and that differences in body shape are

primarily determined by environment. Coon's work is based on a *taxonomic* understanding of anthropometry, in which human beings are divided into types with a set of distinguishing features, (which anthropometry is used to identify). Bigwood's is based on a *plastic* understanding of humanity, in which we are all basically the same, but end up being shaped by our upbringing and environment. [12]

As a tool of taxonomy, anthropometry is used to essentialise and restrict: it assumes that our body shapes are biologically determined and cannot be altered. As a measure of plasticity, anthropometry is used to universalise and transform: it assumes that our body shapes are plastic, malleable, and our differences are explicable through their upbringing. Using the very same measurements – the head circumference, the dimensions of limbs, the weight and height – one of these approaches entrenches inequalities, and the other seeks to level them. One seeks to classify and order people by their pre-existing differences, whereas the other seeks to demonstrate how circumstances can *produce* such differences.

The binary division of anthropometry can be linked with 19th Century scholarly divisions, with human taxonomy associated with anthropology, and human plasticity with public health. Early anthropologists were obsessed with the size and shape of different people, describing and ordering them into classificatory schemes – an activity that grew with the scope of colonial empires, which brought diverse peoples under their scholarly gaze. But just as anthropology concerned itself with the extremities of European empires, public health emerged as the science of slums at home. This forged another role for anthropometry, a more practical role, which was led by social reformers. Anthropometry was used to demonstrate the poor living and

[12] This distinction between taxonomy and plasticity in anthropometry is taken from the work of Stanley Ulijaszek. See Stanley J. Ulijaszek and John Komlos, 'From a history of anthropmetry to anthropometric history', in *Human variation: from the laboratory to the field*, ed. C. G. N. Mascie-Taylor, Akira Yasukouchi, and Stanley J. Ulijaszek, (London: CRC Press, 2010); Stanley Ulijaszek, 'Anthropometric measures', in *Design concepts in nutritional epidemiology*, ed. Barrie Margetts and Michael Nelson, (Oxford: Oxford University Press, 1997).

working conditions suffered by the working classes, used to campaign for better sanitation, food and public housing. Anthropometry, therefore, had two, radically different roles in Victorian scholarship: to document racial differences, and to drive domestic change.[13]

These roles did not inhabit mutually exclusive territory. Especially in the first half of the 20th Century, it was quite possible to accept both uses of anthropometric measurement, maintaining an interest in the classification of people abroad, *and* the reform of working conditions at home. Social reformers – at least initially – used anthropometry on their own race, whereas anthropologists used it on others. As a result, it was quite possible to be racist in relations overseas, and reformist in attitude at home; it was quite possible to believe that upbringing stunted the white working class, but genes shaped the inferior skulls and stature of the savages. It was also possible to suggest that nurture caused differences *within* each race, but nature generated differences *between* them. This grey area, where taxonomical and reformist uses of anthropometry merged, generated the kind of attitude found in the work of Francis Galton, who was a reformist and a racist, seeking to transform living conditions whilst also advocating eugenics, suggesting that the working classes were replicating their inferior physique by breeding too fast, and fearing that the national 'stock' was being shaped by a weaker, degenerate kind of Briton.[14]

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[13] G.W Lasker, 'The place of anthropometry in human biology', in *Anthropometry: the individual and the population*, ed. Stanley J. Ulijaszek and C. G. N. Mascie-Taylor, (Cambridge: Cambridge University Press, 1994); Martorell, 'Notes on the history of nutritional anthropometry'; Tanner, *A history of the study of human growth*; Ulijaszek and Komlos, 'From a history of anthropmetry to anthropometric history'; Caspari, 'From Types to Populations'.

[14] Bernard Semmel, *Imperialism and social reform: English social-imperial thought, 1895-1914* (London: G. Allen & Unwin, 1960), 35-46; Martin Brookes, *Extreme measures: the dark visions and bright ideas of Francis Galton* (London: Bloomsbury, 2004); M. G. Bulmer, *Francis Galton: pioneer of heredity and biometry* (Baltimore: Johns Hopkins University Press, 2003); Nicholas W. Gillham, *A life of Sir Francis Galton: from African exploration to the birth of eugenics* (Oxford: Oxford University Press, 2001).

Nutritionists between the wars

It is in this zone of indistinction that the early nutritionists can be located. Nutritionists were descended from 19th Century social reformers, and their techniques illuminated disadvantage and neglect, but they often drew conclusions that presupposed the importance of race. The early nutritionists measured bodies to identify poor health and improve nourishment, starting with an assumption of human plasticity, and suggesting that body shape is the result of diet rather than race. But as they became involved in the 'discovery' of hunger in the colonial world, nutritionists became inflected with racial paradigms, treating the colonial world as a vast nutritional laboratory within which to examine and test different diets.[15] In this approach, race became a central unit of analysis: different races ate different foods, so one could assess the value of these foods by examining the health and physique of the races. Nutritionists may not have been taken in by the crude biological determinism of physical anthropology, since they continued to insist that many human features were caused by environmental factors such as diet, but their work adopted an essentialism that took races to have distinct physical features, as well as developing a set of value judgements in their evaluation of these diets, and, implicitly, of the races who ingested them.

The interwar studies of McCarrison and McCay offer perhaps the best example of the combination of racial and reformist language.[16] These two nutritionists, who were both active in India before the Second World War, used

[15] The idea of the 'colonial laboratory' is from Vernon, *Hunger*, 104. See also Worboys, 'The discovery of colonial malnutrition between the wars'; David Arnold, 'The 'discovery' of malnutrition and diet in colonial India', *Indian Economic and Social History Review* 31, no. 1 (1994); David Arnold, ed. *Imperial medicine and indigenous societies*, (Manchester: Manchester University Press, 1988).
[16] Robert McCarrison, *Nutrition and national health: being the Cantor lectures delivered before the Royal society of arts, 1936* (London: Faber and Faber Limited, 1936); David McCay, *Investigations into the jail dietaries of the United Provinces with some observations on the influence of dietary on the physical development and well-being of the people of the United Provinces* (Calcutta: Superintendent Government Printing, India, 1912).

nutritional analysis of the diet to explain the 'martial races' theory, which was common amongst colonials of the time: the belief that Punjabis, Pathans and other groups in the north and west of India had a 'manly physique and a fighting spirit', whereas the Bengalis and Madrasis of the south and east were 'feeble, stunted and effeminate'.[17] McCarrison and McCay attributed this difference to the diet, and McCay stated their explanation most succinctly:

> As we pass from the North-West region of the Punjab down the Gangetic plain to the coast of Bengal, there is a fall in stature, bodyweight, stamina and efficiency of the people. In accordance with this decline in manly characteristics it is of the utmost significance that there is an accompanying fall in the nutritive value of the dietaries.[18]

For McCay, the races of north India were strikingly superior in every way:

> …their general muscularity of the body is decidedly better, and their capabilities of labour are greater. They are smarter on their feet, more brisk and more alive to the incidents of every-day life, and they do not present such slackness and tonelessness as one is accustomed to observe in the people of Lower Bengal'.[19]

Both McCay and McCarrison attributed this to the quality of the diet in north India, which they argued, was balanced and rich, based on wheat flour chapatti, dal, and dairy products, producing a series of 'martial attributes' in the local tribes. The diet, in the words of McCarrison, made Punjabis 'the finest race in India', and 'amongst the finest races of mankind'.[20]

[17] Arnold, 'The 'discovery' of malnutrition', 15.
[18] McCay, quoted in McCarrison, *Nutrition and national health*, 19.
[19] McCay, quoted in Arnold, 'The 'discovery' of malnutrition', 13.
[20] McCarrison, *Nutrition and national health*, 20.

This connection between diet and racial characteristics was a common theme in the nutritional studies of the interwar years, and another example is provided in the studies of Gilks and Boyd Orr.[21] These nutritionists, who again worked in the colonial world, launched a study to explain a perceived difference in strength and productivity between Kikuyu and Masai workers in Kenya. Gilks and Boyd Orr started with what was taken as 'common knowledge' amongst colonialists: that 'the full-grown Masai male is on average 5 inches taller and 23lbs heavier than the full-grown male Kikuyu', that the Masai's 'muscular strength is… 50% greater', and that the Kikuyu, and 'especially the male Kikuyu', has 'a very low capacity for work and power of endurance'.[22] In attributing this to the diet, the authors made a slightly more cautious conclusion than McCay and McCarrison, not ruling out heredity as a cause of the difference, but suggesting that food was still central: the milk- and meat-based Masai diet, the authors claimed, was superior to that of the Kikuyu, which was 'badly balanced… too rich in carbohydrate, and deficient in calcium'.[23] The solution proposed was typical of colonial development projects of the time: a transformation in diet, agriculture, and animal husbandry for the Kikuyu, which, they argued, 'will almost certainly be accompanied by an improvement in the health and working capacity of the natives themselves'.[24]

These studies read today as highly racist, but they were, in fact, a radical challenge to established views. Despite talk of 'manly' Sikhs and 'supine' Bengalis, of strong Masai and lazy Kikuyu, the nutritional perspective represented a rejection of

[21] John Boyd-Orr and John Langton Gilks, *Studies of nutrition: the physique and health of two African tribes* (London: H. M. Stationery Office, 1931). For some context to this study, see Cynthia Brantley, 'Kikuyu-Maasai Nutrition and Colonial Science: The Orr and Gilks Study in Late 1920s Kenya Revisited', *The International Journal of African Historical Studies* 30, no. 1 (1997); Vernon, *Hunger*, 109-17; Diana Wylie, 'Disease, diet and gender: late Twentieth-Century perspectives on Empire', in *The Oxford history of the British Empire, volume V: Historiography*, ed. Robin Winks, (Oxford: Oxford University Press, 1998), 280-82; Worboys, 'The discovery of colonial malnutrition between the wars', 210-13.
[22] Boyd-Orr and Gilks, *Studies of nutrition*, 9, 31.
[23] *Studies of nutrition*, 11.
[24] *Studies of nutrition*, 12.

biological determinism, and the emergence of a more universal conception of humanity. With the emphasis on diet, there was no longer a suggestion that weakness was the result of inherited degeneracies, or that tribes were less 'manly' due to *inherent* inferiority. The nutritionists were suggesting, in contrast, that 'what made the Punjabi a warrior and the Bengali a wimp' was not their race, per se, but the food they ate.[25] By prioritising human plasticity over racial typology, differences in physique were explained through environment rather than heredity. In fact, in a rather self-aggrandising move, diet was presented as *the* overriding factor that shaped health and human form. This perspective, known as dietary determinism, suggested that physique was overwhelmingly determined by the diet, underlining and reinforcing the importance of the nutritionists' own profession.

From racism to universal man

For all its problems, dietary determinism was a stepping-stone to universalism. It implied a set of interventions that could improve everyone's fortunes, regardless of their origins. For nutritionists such as McCarrison and Boyd Orr, the solution to weakness and poor health was to improve people's diets – an improvement that could be made for people whatever their race, wherever they lived in the world. Rejecting the exceptionalism that was embedded in 'tropical medicine' – the idea that health problems in the colonies were fundamentally exotic and unusual – they applied a universal methodological template to their dietary surveys, suggesting that dietary problems were similar in Britain and Bengal, and that even the West had something to learn.[26] Indeed, McCarrison compared the Sikh diet favourably with that of the 'poor

[25] Arnold, 'The 'discovery' of malnutrition', 15.
[26] The exceptionalism of tropical medicine is covered in Worboys, 'The discovery of colonial malnutrition between the wars', 211.

European' diet, waxing lyrical about the qualities of the former, and suggesting ways that the latter could be enhanced.[27]

The assumption underpinning the studies of the interwar nutritionists, therefore, was that all diets could be compared dispassionately. In the hands of nutritional scientists, what people eat anywhere in the world could be judged according to objective criteria, and placed in a hierarchy. The nutritionists did not assume that Western diets were necessarily superior; indeed, with progressive changes in the diet, the health and physique of *all* peoples could be improved. The 'toneless and supine' races of Southern India, the Kikuyu labourers of Kenya, the working classes of the English cities: all these groups could become stronger, their health could be enhanced, and they could reach the heights of the pure, unadulterated, objectively superior physique of the Sikhs. By rejecting the idea of predestined racial characteristics, we were left with a world of plastic bodies, which could be moulded and improved.

Yet this was *only* a stepping-stone to modern universalism, and the studies remained patronizing and paternalistic. For a start, they hardly had humanitarian aims, since the aim was to address the weakness of certain 'tribes' in order to make colonial subjects better labourers. The studies were permeated with the language of the 'human motor', in which bodies are seen through an input/output dynamic, and presented as mere machines.[28] These studies were also highly essentialist, and therefore resolutely racist. McCarrison may have opposed biological determinism, and rejected the idea that 'Indian races' had predetermined attributes, but he still assumed there *were* such things as races, and he assumed these races *had* essential attributes. Races were assumed to be clearly bounded, and could be judged in a hierarchy, based on the quality of their physique. Races and foods were judged to be

[27] McCarrison, *Nutrition and national health*, 24-25.
[28] For more on the idea of the 'human motor', see chapter four.

weak or strong, good or bad, irrational or rational, based on their 'physical efficiency'. Even McCarrison's romanticism of certain groups – such as the Sikhs – simply underlined the colonial imperative to pass judgement on cultural practices and to assert the superiority of rational and scientific criteria. The studies were therefore not just essentialist; they were also highly judgemental.

The assumptions of the interwar nutritionist, therefore, can be contrasted with the individualised anthropometry of Biafra. By the late 1960s, a revolution had taken place in nutritionism, which discarded any talk of race, and treated each person as an individual unit. Each person was treated as equal and comparable, and the goal of anthropometry was to measure bodies and determine individual eligibility for food. There was no racial stereotyping, no generalisations about the physique, and no instrumentalist logic; instead, each person was measured and compared to a reference population, and the extent to which they differed from that reference population was taken as justification to provide them with food. Their difference was not attributed to race, nor were their dietary practices subjected to extensive criticism. In Biafra, as today, evidence of abnormal body size was enough to instigate a feeding programme. The aim was to bring the person into line with an agreed, minimum standard of size and weight.

The defining moment in this transition away from the racist underpinnings of anthropometry took place in 1951, when UNESCO issued a statement on race and human difference.[29] This marked an important moment in the fight against racism, articulating a scientific agreement, which could be harnessed to the political struggle for universal human rights. The declaration created a unity of mankind, a fundamental human equality, which was based on scientific fact, not just on political philosophy or ideological argument. Unlike the Universal Declaration of Human Rights from a few

[29] Unesco, 'Statement on the nature of race and race differences, 1951', in *Four statements on the race question*, ed. Unesco, (Paris: Unesco, 1969).

years earlier, this statement was generated by biologists, physical anthropologists, and geneticists – scholars certified to produce *scientific* knowledge about race, and to certify its illegitimacy. The statement famously began: 'Scientists have reached general agreement in recognising that mankind is one: that all men belong to the same species, *Homo Sapiens*.' For many, this moment marked the end of eugenics and social Darwinism as acceptable scientific endeavours.[30]

Donna Haraway is one author who recognises the importance of this moment, arguing that after the UNESCO declaration, it became less and less acceptable to harness anthropometry to racial categories.[31] Humans, she points out, had now been 'biologically certified' for equality; the natural sciences had now come out in support of the universalist political project. Although Carleton Coon continued to publish works like *The Origin of Races*, he was increasingly marginalised, and a 'new physical anthropology' emerged instead.[32] Based on the writings of Sherman Washburn, the new physical anthropology prioritised 'adaptive complexes' over race, and suggested that humans could be divided into 'populations': communities who had adapted to their environments differently, which did not imply any underlying inferiority. With the new physical anthropology, differences in human form were explained *not* through race, but through 'functional anatomy', that is, a collection of functional, circumstantial reasons for physical adaptation.[33] Anthropometry became deracialized, separated from the legacies of fascism and colonialism. It became

[30] William H. Tucker, *The science and politics of racial research* (University of Illinois Press: Champaign, 1994), 138-80; Elazar Barkan, *The retreat of scientific racism: changing concepts of race in Britain and the United States between the world wars* (Cambridge: Cambridge University Press, 1992), 341-46; Michael Banton, *The international politics of race* (Cambridge: Polity Press, 2002), 28-39; Naomi Zack, *Philosophy of science and race* (London: Routledge, 2002), 87-103; Natan Lerner, 'New Concepts in the UNESCO Declaration on Race and Racial Prejudice', *Human Rights Quarterly* 3, no. 1 (1981).
[31] Donna Haraway, 'Remodelling the human way of life: Sherwood Washburn and the New Physical Anthropology, 1950-1980', in *Bones, bodies, behavior: essays on biological anthropology*, ed. George Stocking, (Madison: University of Wisconsin Press, 1988).
[32] A comprehensive account of this controversy can be found in Jackson, 'In Ways Unacademical'.
[33] Caspari, 'From Types to Populations'.

hitched to the decolonised, universalist, multi-national ideals of the post-war world. Human plasticity had triumphed over taxonomy.[34]

How did this impact the sphere of nutrition? There is little doubt that studies of nutrition also took a universalist turn in the 1950s and 1960s. There were still elements of racial typology in nutrition work, particularly in post-WWII relief, but this involved clarifying dietary preferences, and was not a tool for ranking diets. Post-war relief handbooks stressed which foods were preferred by which nationalities, but did not pass judgement on these diets, nor divide races by the quality of their physique.[35] Screening and measuring hunger also became standardised, particularly after the Bigwood handbook, as needs and bodies were compared to a universal template. Nancy Scheper-Hughes takes a rather cynical view of this post-war turn towards universal standards of nourishment, writing that 'the attention of biomedical scientists to the subject of hunger had to wait until *white* Europeans began to suffer from the same conditions that had long afflicted black and brown peoples in many parts of the world'.[36] But such a perspective neglects what a profound intellectual achievement the consensus around human universality really was.

'Universal man' was a painstaking construction, negotiated by a set of extensive alliances. It may have had a few less progressive connotations – as Haraway has argued, it led to a very gendered notion of 'man the hunter' and supported the establishment of ideological visions of human nature, associated with market capitalism and liberal democracy (hunting, carnivorous curiosity and aggression were assumed to be national features of human life) – but it was a profoundly egalitarian

[34] Ulijaszek and Komlos, 'From a history of anthropmetry to anthropometric history'.
[35] See, for example, the handbook given to new recruits into the Friends Relief Services, 'Notes for relief workers: the Phoenix Park Lectures', September 1943, Quaker archives, box FRS/1992/28. Section entitled: 'European Peasant Diets'. Or the handbook produced by the Council of British Societies for Relief Abroad, 'Nutrition and relief work: a handbook for the guidance of relief workers', 53-69.
[36] Nancy Scheper-Hughes, 'Hungry bodies, medicine, and the state: towards a critical psychological anthropology', in *New directions in psychological anthropology*, ed. Theodore Schwartz, Geoffrey White, and Catherine Lutz, (Cambridge: Cambridge University Press, 1992), 223.

achievement.[37] There was nothing inevitable about the role of anthropometry in determining malnourishment, especially in its egalitarian, universalist guise. Indeed, anthropometry required the triumph of universality to function. In Latourian terms, we can also say that this achievement required constant maintenance, since its fragility is evident in the periodic re-emergence of academic notions of inferiority and superiority, which must be carefully defended against.[38]

Normality

Normality was another achievement. The anthropometric practices in Yusuf Batil not only assumed all humans to be part of the same species, but also compared refugee bodies to others, who had been certified as 'normal'. In order to use anthropometry, it was not enough to measure people, and have developed the right tools for the job.[39] Nor was it enough to believe in 'universal man', and to reject the racial determination of body shape. With the measuring instruments in hand, and the belief that such measurements yield important information about a person's environment, a set of 'reference data' was also needed to see whether a child was normal.

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[37] In Haraway's words, 'man the hunter' was a contradictory creature in this vision: 'a natural global citizen as well as a natural neo-imperialist; a natural political man as well as a natural sadist; a natural providential father and a reliable colleague, as well as a natural male supremacist. His plasticity defined him; his most fundamental pleasure threatening him with extinction…. At the origin, man was made as his own creator and destroyer, fully free, constrained only by a nature that made him equal to his brothers and responsible for his fate. Hunting is the act of human procreation, founding at once the nuclear family and the family of man – and laying the foundation for the uneasy technological-family discourses of a nuclear era'. Haraway, 'Remodelling the human way of life', 232.

[38] A recent controversy of this type is that surrounding Richard J. Herrnstein and Charles A. Murray, *The bell curve: intelligence and class structure in American life* (New York: Free Press, 1994). For responses, see Marek Kohn, *The race gallery: the return of racial science* (London: Cape, 1995), 110-19; Joseph L. Graves, *The Emperor's new clothes: biological theories of race at the millennium* (New Brunswick: Rutgers University Press, 2001), 1-13; Claude S. Fischer, ed. *Inequality by design: cracking the bell curve myth*, (Princeton: Princeton University Press, 1996); Steve Fraser, ed. *The Bell curve wars: race, intelligence, and the future of America*, (New York: Basic Books, 1995); Joe L. Kincheloe, Shirley R. Steinberg, and Aaron Gresson, eds., *Measured lies: the bell curve examined*, (Basingstoke: Macmillan, 1996).

[39] For an account of one such tool, the MUAC band, see introduction to Part III.

How does reference data work in anthropometry? It operates as a point of comparison. To see whether a child's measurements are normal or not, we compare them to similar measures in a healthy set of people. If we screen someone using the mid-upper arm circumference, for example, we compare their measurements with a well-nourished population. This reference data is drawn from a sample of several hundred people, which captures the extent of 'normal variation' amongst a group of healthy people. If the arm circumference of the person we are screening appears at the lower end of the distribution of this reference data, it is likely that that person is malnourished. If it falls in the middle or upper end, it is likely they are healthy. The reference data, therefore, shapes the cut-off points at which we declare someone to be malnourished.[40]

This process helps clarify why anthropometric screening can be no more than an *indicator* of malnutrition.[41] The key thing about the 'reference population' is that all people contained in this data are considered well nourished: even the people at the extremes are part of what constitutes 'normal variation' in a healthy population. When a child's measurement falls in the extremes, there is always a chance that they are healthy, but small. In other words, their size might just be one of the cases naturally found in the left-hand tail of the distribution. Of course, this caution does not apply when used in the survey of a population. The more cases that are examined, the more it will become clear that incidences of below-average weight are a pattern in the population, constituting extensive malnourishment rather than normal variation. But for screening, the caution must remain. Each case has a margin for error, which can only be erased across a population. As a result, declaring someone to be malnourished

[40] A very nuanced and detailed summary of this process can be found in Jelliffe and Jelliffe, *Community nutritional assessment*, 110-22. See also Rosalind Gibson, *Principles of nutritional assessment* (Oxford: Oxford University Press, 2005), 299, 350.
[41] The use of nutritional anthropometry as a screening tool, and its restriction as an indicator, not a definition, of malnourishment, is discussed at the end of chapter seven.

on the basis of a single anthropometric measure is not statistically justified, even though, in practice, it happens all the time.

Yet this whole process relies on the reference data, which stipulates what is normal. Without the reference data, a person's measurement cannot be compared with anything: it cannot be judged, and the individual cannot be classed as pathologically or normally sized. In creating a benchmark for starving bodies, however, the idea of normality is *created*; it is not simply uncovered. In Latour's terms, the 'normal' body shape is not just sitting out there in the external world, waiting to be discovered; it is created through the act of measuring bodies, compiling them, and transforming them into a tool for statistical comparison. In the next two sections I look in more detail at how anthropometric reference data is created. First of all, I argue that it is a *conceptual* creation: the very idea of something being 'normal' is historically specific, emerging from the 19th Century and the rise of statistical methods. Second, I argue that it is a *material* creation: the data representing 'normal' body sizes do not just exist in the world, ready to be grabbed and used; this standard of normality is painstakingly produced, through a long process of sampling, measuring, and statistical coordination.

Normality as a conceptual creation

To take the first point, there is a general, conceptual sense in which normality is created: it is a product of the 19th Century, bound up with the rise of statistics and particularly in Quetelet's work on the 'average man'.[42] Many authors have examined what this meant for society, concluding that it represents a profound realignment of

[42] Adolphe Quetelet, *A treatise on man and the development of his faculties* (Edinburgh: W. & R. Chambers, 1842); Stephen M. Stigler, *The history of statistics: the measurement of uncertainty before 1900* (Cambridge: Belknap Press, 1986), 169-78.

our understanding of the world. For Ian Hacking, the emergence of statistical methods represented the 'taming of chance', the moment that seemingly random occurrences, which were not determined by firm causal laws, became scientifically respectable.[43] Previously, scientists were looking for inexorable laws of nature. The idea of something occurring because of chance was vulgar and irrational. It was evidence of humans having not yet uncovered the true rules governing the world, proof of our ignorance and barbarity. With the rise of statistics, however, chance could be 'tamed': understood and subjected to a set of laws and procedures. It became less terrifying, less irrational as a result. Hacking suggests that this epistemological transformation also led to new ontological ideas. After the taming of chance, scholars looked at humans differently. No longer were scholars seeking to uncover laws about human nature, understanding the 'natural' and eternal conditions of humankind. Instead, they sought to understand what the average or normal human would do. In Hacking's words, this meant that '"Normal" bears the stamp of the nineteenth Century and its conception of progress, just as "human nature" is engraved with the hallmark of the enlightenment. We no longer ask, in all seriousness, what is human nature? Instead we talk about normal people'.[44]

Other authors have identified further transformations that accompanied statistics, particularly those that affected perceptions of the body. Lennard Davis, for example, argued that 'normality' could be compared to the paradigm of perfection, which existed in the time of the Renaissance.[45] Epitomised by Leonardo da Vinci's 'Vitruvian Man', the paradigm of perfection holds up an ideal standard, which no one can fully meet. All human beings fall below this standard; no one can have an ideal body. But since everyone exists in varying degrees of imperfection, no one is

[43] Ian Hacking, *The taming of chance* (Cambridge: Cambridge University Press, 1990).
[44] *The taming of chance*, 161.
[45] Lennard J. Davis, *Enforcing normalcy: disability, deafness, and the body* (London: Verso, 1995), 101.

expected to have an ideal body. This can be contrasted with the nineteenth century arrival of statistics, which transformed our judgements about the body. In the bell curve, the majority of people are 'normal', clustered around the mean. Yet there are a minority of people at the extremes of the distribution, who are considered abnormal. This, according to Lennard, led people to *strive* to become normal. Unlike the perfection of the Vitruvian Man, normality became achievable, but it also pushed abnormal minorities to the sidelines of unacceptability. The normal was now achievable, but only because it was majoritarian, leaving its opposite – abnormality – in a zone of extremity, a minority condition with a dark, deviant character.

Many nineteenth century social theorists contributed to this value-laden division of the world. Durkheim, for example, presented the normal as a 'natural' state, an equilibrium or desirable status quo. Comte and Quetelet saw the normal state as purified, free from deviant extremities. By the later 19th Century, even the normal became inadequate. For eugenicists such as Galton, 'normality' was highly unsatisfactory, because it represented societal inertia: when it came to physique, Galton wanted to support people at the upper tail of distributions, ridding society of the weak, the stunted, the degenerate – even the statistically average. The idea of normality had, for Galton, taken on an air of insufficiency, as something mediocre, middling, and run-of-the-mill.

In all of these cases, normality was not just a descriptive term constituting what was average; it also constituted a moral value, a normative position. To speak of what is normal was not just to state a fact, it was also to suggest what is desirable. As Ian Hacking has pointed out, 'normal' is a word that has been 'dancing and prancing' all over the distinction between facts and values for years.[46] What is normal is often taken to be normative – to be right. As a result, 'normality' has a moral quality built

[46] Hacking, *The taming of chance*, 163.

into it. In Hacking's words, 'we can use the word to say how things are, but also how they ought to be – and we can use it to say both things at once… The norm might be what is usual or typical, yet our most powerful ethical constraints are also called norms.' This strange, modern word tramples all over the sacred philosophical distinction between 'is' and 'ought', designating both empirical and normative statements.

When used in nutritional anthropometry, normality suffers from precisely this conceptual confusion: the extent of 'normal variation' in the reference data does not just describe what has been found in a certain population, it also represents what is desirable for everyone else. The 'reference population' establishes an empirically 'normal' body shape, but it also implies a normative target, which should be aimed at. This may be disguised by phrasing it as a 'reference' rather than a 'standard', but the effect is much the same: there is a moral judgement bound up in this process.[47] To be measured and found in the zones of extremity is to be abnormal, to be pathological, and that, in the end is what justifies intervention. When the nutritionist measures someone and discovers them to be thin compared to the reference data, they are not just collecting data, or conducting scholarly research, they are categorising for action. There is a strong moral content to this process of measurement: the ethical values inherent in the notion of normality are a central component of humanitarian action, spurring the subsequent feeding programme as well as the initial assessment.

It is hard, in light of this, to see what is wrong with a conflation of descriptive and normative terms. Confusing the distinction between 'is' and 'ought' might be a philosophical problem, but it is certainly not a moral problem, at least insofar as it relates to nutritional anthropometry. To be thin, surely, is to be abnormal, and to be

[47] "In practice, it is almost impossible to prevent the use of reference data as standards for judging the nutritional status of individuals". Mercedes de Onis and Ray Yip, 'The WHO growth chart: historical considerations and current scientific issues', *Bibliotheca Nutritio et Dieta*, no. 53 (1996): 77. See below for more on the blurring of lines between a 'reference' and a 'standard'.

abnormal – in this case – is certainly bad. Why does it matter that the notion of 'normality' is historically constructed and embedded in value judgements? What is wrong with designating some body sizes as 'normal' and saying that 'normality' is better, when the alternative is starvation? It is surely a moral act to help people recover from starvation, and if 'normality' helps us undertake this, the conflation of descriptive and moral categories becomes a rather insignificant problem.

Further light may be shone on this situation if one considers some literature from the anthropology of biomedicine. Normality, again, is the target of several critiques when it is used in medicine, and nutritional anthropometry, as we have seen, is a deeply medicalised pursuit. Margaret Lock and Vinh-Kim Nguyen, for example, have argued that biomedicine is reliant on the notion of a 'normal' or 'standardised' body, into which we are fitted every time we seek assistance.[48] When we go to a hospital for examination, we are judged to be normal or abnormal, standard or unusual, since disease is defined as an 'abnormal condition', statistically defined. The effect of this, according to Lock and Nguyen, is that biomedicine is oriented towards bringing about the 'normal' rather than attending to the individual's perspectives and personal needs. This is a common anthropological critique of biomedicine, given a slightly different twist: anthropologists have long pointed out that biomedicine reduces health to a set of physical observations, and that it neglects people's life situations or subjective feelings, but here, in addition, is the claim that biomedicine confuses 'a statistical construct with true wellbeing'.[49]

When we take this critique and apply it to nutritional anthropometry, it seems, on the face of it, to be misguided. In the context of starvation, what is wrong with bringing about the normal, if this means feeding people until they reach a decent,

[48] Margaret Lock and Vinh-Kim Nguyen, *An anthropology of biomedicine* (Chichester: Wiley-Blackwell, 2010), 33-56.
[49] *An anthropology of biomedicine*, 45.

healthy size? What is the problem with seeing thinness as pathological, given that severe acute malnutrition is likely to end in death? What is the matter with defining starvation through statistical methods, if this helps us help people in need? Yet the problem – insofar as there is one – lies in the mobilisation of normality to underpin a feeding programme. This is a limited and partial way of measuring and understanding malnourishment, which is not strictly necessary. Responding to starvation need not involve the silent measurement of bodies, nor their comparison to a constructed ideal. Just as biomedicine is criticised for conflating physical abnormalities with true wellbeing, nutritional anthropometry can be criticised for reducing hunger, in all its complexity, to a simplistic bodily measure. Its aim is restricted: returning people to the zone of physical 'normality', then discharging them, leaving the social and subjective experiences of hunger unaddressed. It also measures hunger in a purely corporeal manner, ignoring its cultural and social manifestations.[50]

Normality as a material creation

To summarise the argument so far: the notion of normality conflates description and moral judgement. To speak of what is normal is not just to state an empirical fact, but is also to suggest what is desirable, and what is pathological. In the assessment of body size, this does not appear to be a problem, since the extremes are self-evidently dangerous, with death resulting from prolonged starvation. Judging

[50] Many anthropologists have examined the social effects of persistent hunger. For an overview, see Robert Dirks, 'Social responses during food shortages and famine', *Current Anthropology* 21, no. 1 (1980). For some classic works, see Audrey Richards, *Hunger and work in a savage tribe: a functional study of nutrition among the southern Bantu* (London: Routledge, 1932); Dorothy N. Shack, 'Nutritional Processes and Personality Development among the Gurage of Ethiopia', *Ethnology* 8, no. 3 (1969); William A. Shack, 'Hunger, Anxiety, and Ritual: Deprivation and Spirit Possession Among the Gurage of Ethiopia', *Man* 6, no. 1 (1971); Michael W. Young, "The Worst Disease': the cultural definition of hunger in Kalauna', in *Shared Wealth and Symbol: Food, Culture, and Society in Oceania and Southeast Asia*, ed. Lenore Manderson, (Cambridge: Cambridge University Press, 1986); Scheper-Hughes, *Death without weeping*. Turnbull wrote a rather less sympathetic account of the social effects of persistent hunger. Colin M. Turnbull, *The mountain people* (London: J. Cape, 1972).

people as abnormal, therefore, leads not just to an empirical statement but also an ethical imperative, but there is nothing wrong with that: rescuing people from starvation is a clearly moral act – and an eminently defensible one, too.

The problem, however, is subtler. In anthropometry, normality is bound up in a rather *specific* definition of hunger, one that relies on body shape, and compares bodies as a benchmark for assistance. In this view of hunger, one can only be objectively starving if one's weight compares unfavourably with what is normal. This is problematic insofar as it offers a limited and restricted view of hunger, but it is also problematic insofar as the data *defining* what is normal has been drawn from a limited number of people.

This last issue is crucial: the meaning of 'underweight' or 'abnormal thinness' is defined in relation to a set of reference data, which has been constructed from a selected group of people. This data set does not just exist out there in the world, waiting to be grabbed and used; it needs to be created. People need to be selected, they must be measured, and the resulting figures have to be compiled and presented in graphs and tables. What appears as a universal template for normality, therefore, is really a material creation, a selection of anatomical information from specific populations presented for comparison. In this process of selection and creation, a de-contextualised ideal becomes super-imposed on radically different environments.

Consider the origins of anthropometric reference data in the middle of the Twentieth Century. When anthropometry became more common as a tool for measuring and diagnosing malnutrition, physicians were reliant on a rather limit set of growth studies, all conducted in Western countries. Among the more common were the Meredith growth curves, which came from Iowa, and the Tanner growth curves, which came from the UK.[51] By the late 1950s, data produced in Boston, known as the

[51] de Onis and Yip, 'The WHO growth chart', 75; Roberto Frisancho, *Anthropometric standards for the assessment of growth and nutritional status* (Ann Arbor: University of Michigan Press, 1990), 1-3.

'Harvard Standard', became the most common tool for nutritional anthropometry: taught to paediatricians in many countries, this data became a global standard after it was included in Jelliffe's nutritional handbook and distributed by the World Health Organisation as the recommended growth reference.[52] According to Jelliffe, this data had several advantages: it had been carefully compiled, it was based on a detailed longitudinal study of children between 1930 and 1956, and it was widely available in *Nelson's Textbook of Paediatrics*, which, at the time, was one of the most popular in the world.[53] But there were some serious drawbacks of the Harvard Standard, as well: it was drawn from a small number of children, who were unrepresentative in their origins, and by the late 1960s the data appeared rather old. It seemed rather absurd to compare children from around the world with a study of just 100 White American children, none of whom had been excluded for being overweight.[54]

In the 1970s, therefore, another reference was created, intended to be more comprehensive and up-to-date. Led by the United States National Center for Health Statistics (NCHS) and the Centers for Disease Control (CDC), this study drew from a larger, more diverse sample size and was compiled from two different data sets. The reference for ages 0-23 months was based on a longitudinal study in Ohio, which took place between 1929 and 1975. The data for 2-18 years were based on a number of cross-sectional surveys in the USA, conducted between 1960 and 1975.[55] These data had a much larger sample size than the hundred or so children that had been involved in creating the Harvard reference; they were, however, still based on a globally

[52] Jelliffe, *The assessment of the nutritional status of the community*. de Onis and Yip, 'The WHO growth chart', 75; McLaren, 'A fresh look at anthropometric classification schemes in Protein-Energy Malnutrition', 275.
[53] H. C Stuart and S. S Stevenson, 'Physical growth and development', in *Textbook of pediatrics*, ed. Waldo Emerson Nelson, (Philadelphia: Saunders, 1959), 12-61; Jelliffe, *The assessment of the nutritional status of the community*, 57.
[54] Gueri, Gurney, and Jutsum, 'The Gomez classification: time for a change?', 774; McLaren, 'A fresh look at anthropometric classification schemes in Protein-Energy Malnutrition', 275.
[55] de Onis and Yip, 'The WHO growth chart', 76; P. V. Hamill et al., 'Physical growth: National Center for Health Statistics percentiles', *The American Journal of Clinical Nutrition* 32, no. 3 (1979).

unrepresentative group, consisting entirely of North American children. The infants, in particular, all came from a similar ethnic and socio-economic group, and many overweight children were included. Most significantly, most of the sample had been fed with artificial milk – something that skewed the data and frustrated the nascent breastfeeding campaign, which was emerging in the same period – but all the same, the NCHS/CDC data was adapted and adopted by the WHO, and it became the recommended replacement for the Harvard Standard for the next twenty years.[56]

The longevity of the American reference data, and its adoption as a global standard, is largely explicable on practical grounds. Producing growth data is difficult and costly, requiring good organisation and a long-term commitment, especially when longitudinal data is concerned. The ideal, for many countries, is to create their own standards, reflecting the ethnic and environmental circumstances of their territory. It would be more reasonable – not to mention more politically appropriate – to judge a Peruvian child against Peruvian data, or a Ghanaian child against Ghanaian data, rather than judging all against American children. But the work involved in producing reference data is considerable: the NCHS/CDC study drew on a longitudinal study that took place over four decades, and three cross-sectional studies, conducted over a decade and a half. In these surveys, at least 200 children of each sex were included for every age group, and techniques were standardised, with each measurer carefully trained with the same tools and instructions. The data had to be collected and compiled – a massive task, given the number of measurements involved – and finally processed into a smoothed curve. The production of reference data, therefore, was a

[56] The problems with the NCHS data have been summarised in a number of publications. Cesar G. Victora et al., 'The NCHS Reference and the Growth of Breast- and Bottle-Fed Infants', *The Journal of Nutrition* 128, no. 7 (1998): 281; de Onis and Yip, 'The WHO growth chart', 82-86; J. Gorstein et al., 'Issues in the assessment of nutritional status using anthropometry', *Bulletin of the World Health Organization* 72, no. 2 (1994); Frisancho, *Anthropometric standards for the assessment of growth and nutritional status*, 1-3; Cutberto Garza and Mercedes de Onis, 'Rationale for developing a new international growth reference', *Food & Nutrition Bulletin* 25, no. 1 (2004).

feat of organisation, staffing, regulation, and coordination – all of which cost a considerable sum.[57]

Reference data, therefore, is a painstaking construction, involving a great deal of work. It can be analysed in the same way as the production of any scientific fact, which require various levels of mediation before generating agreement and authority. But there was also a second reason each country did not produce its own reference data: it was not just down to the cost, but also due to an ideological commitment to universality. After the triumph of 'universal man' and agreement that body size is largely responsive to environment, international nutritionists took American data as an ideal to apply to everyone. Variations in body size from ethnicity or heredity, they declared, is minor compared to variation emerging from environment or upbringing.[58] There was a kind of radical egalitarianism in this view: the worldwide applicability of American growth curves was not seen as an instance of imperialism, but an application of equality. What was good in the West was also good for the rest. The favourable circumstances embodied in American children should be a reference point for the whole world. Universal man means universal standards, and an end to the idea that some ethnicities and races should be judged by different criteria.

When we look at this process, we see that the selection of data *produces* what is normal. If you choose a set of American children for the growth curve, you get one idea of normality. What is normal and healthy, in other words, is embodied in American children: their diet, their upbringing, their circumstances. If you choose

[57] For a summary of how the NCHS data was created, see de Onis and Yip, 'The WHO growth chart', 75-76.

[58] Philip Graitcer and Eileen Gentry, 'Measuring children: one reference for all', *The Lancet* 318, no. 8241 (1981); Kevin Sullivan et al., 'Growth references', *The Lancet* 337, no. 8754 (1991); Jean-Pierre Habicht et al., 'Height and weight standards for preschool children: how relevant are ethnic differences in growth potential?', *The Lancet* 303, no. 7858 (1974); de Onis and Yip, 'The WHO growth chart', 77-78; Editorial, 'A measure of agreement on growth standards', *The Lancet* 323, no. 8369 (1984); For the alternative view, see H. Goldstein and J. M. Tanner, 'Ecological considerations in the creation and the use of child growth standards', *The Lancet* 315, no. 8168 (1980); For a response, see J. C. Waterlow, 'Letter: child growth standards', *The Lancet* 315, no. 8170 (1980).

Ghanaian children, however, you get another idea of normality. What is normal and healthy, in other words, is embodied in *their* diet and upbringing. Yet making a global standard from Ghanaian children is not something many mid-Century nutritionists could accept: it was agreed that American data offered a good model of health, because it was a rich nation, with a decent standard of public health, and a set of living standards to which many other countries aspired. The same could not be said for Ghanaian data. Many Ghanaian children had health problems and growth defects, so incorporating *their* measurements into a growth curve would skew normality into accepting a sub-standard of health.

The definition of 'normal', therefore, is dictated by the source of the reference data. It is decided by the creators of the growth studies, and the children who are included or excluded. The act of converting some measurements of American children into data for nutrition programmes involves a subtle move from description to evaluation, from an empirical statement to a normative one. In this shift, the data from the American children becomes a statement of what it means to be normal and abnormal. And since 'normality' is a moral judgement of what is right and proper, as well as an empirical description of circumstances, the moral standard becomes embedded in the creation of the data itself.

This is not an original observation; indeed, the creators of anthropometric data have been acutely aware of this shift. To deal with the conflation of fact and norm, they started making a distinction between a 'reference' and a 'standard'.[59] According to leading UN nutritionists, a reference is 'a device for grouping and analysing data for the purposes of enabling value-free comparison'. In other words, it is to be taken with a pinch of salt, not assumed to be a target by itself. But a standard is 'a device that enables value judgements by incorporating norms and targets into their

[59] World Health Organization Working Group, 'Use and interpretation of anthropometric indicators of nutritional status', *Bulletin of the World Health Organization* 64, no. 6 (1986): 932.

construction'. In other words, it is something to be aimed at, a proud and precise description of normality.[60] The Harvard growth standard, therefore, was actually only a reference. It was presented as a 'guide for screening and monitoring', but never claimed to be an 'absolute criterion to define 'malnutrition' or pathology'.[61] Herein lay its longevity, as it could avoid accusations of imperialistically imposing American measures on other children. It was couched carefully as a reference, a useful set of data. Fact and value were meant to stay separate, although in practice, it was impossible to prevent the value judgement from creeping in, because the very act of holding the American children as a point of comparison *encouraged a value judgement*.[62]

The issue went to the heart of the next big attempt to produce reference data for anthropometric comparison, which occurred in the 1990s. In this attempt, the WHO wanted to replace the NCHS/CDC data, which they saw as compromised by both its American sample and the formula-fed babies in its study.[63] The project, which was known as the Multicentre Growth Reference Study (MGRS), drew on data collected from around the world, and restricted children included in the study to those who were being breastfed. The WHO also decided to make what was previously implicit, explicit: it articulated its aims as producing a standard, rather than a reference. This new data was articulated clearly as 'a norm or desirable target', producing a model of growth that 'ought to be met'. It was a common standard for 'healthy development and growth', which would apply to everyone around the world.[64] Planning for the MGRS was instigated by the WHO in 1990, and finally published in 2006.

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[60] Garza and de Onis, 'Rationale for developing a new international growth reference', 510.
[61] de Onis and Yip, 'The WHO growth chart', 77.
[62] This, once again, was recognised by the creators of data, who stressed the need to 'choose references that resemble, as far as possible, true standards'. 'The WHO growth chart', 77.
[63] Garza and de Onis, 'Rationale for developing a new international growth reference'.
[64] G. Zorlu, 'New WHO child growth standards catch on', *Bulletin of the World Health Organization* 89, no. 4 (2011): 250.

Although this story falls outside the historical limits of the rest of the thesis, it is very important, since the MGRS was the first time nutritionists admitted what had long been obvious: they were constructing a normative ideal for all children, a standard to which *everyone* should be compared. It was constructed by stipulating what kind of environment is 'optimal for growth', and then finding sites that met such stringent conditions. It began by determining what it means to live in the best conditions possible, and then drawing data only when these conditions were met. Considerations ranged from altitude to epidemiology. To be selected for the survey, an area had to have low infant mortality, low rates of stunting, and high access to clean drinking water. The site had to be at less than 1,500 metres (since higher altitudes were associated with smaller stature), and to be free from environmental contamination such as radiation. The site had to have strong hospital facilities, communication facilities, and a 'breastfeeding support system'. The area also needed to have a socio-economic status that 'did not constrain growth', and sites that failed to meet these conditions were excluded. In the end, locations within six geographically dispersed countries were chosen, and the data was collected from specific regions within Brazil, Ghana, India, Norway, Oman, and the United States.[65]

In these regions, a further set of exclusions applied. Only individuals with 'no health, environmental or economic constraints' could be selected for the survey. The criteria for selecting newborns included looking at 'parental education and income levels', ensuring they came from a non-smoking home, choosing only children who were born between 37 and 42 weeks of gestation, ensuring they were breastfed for at least twelve months, and including only children who were a single birth – i.e. not one of twins or triplets.[66] This extensive set of conditions, chosen for being 'favourable

[65] The methodological details in this paragraph are all taken from Mercedes de Onis et al., 'The WHO Multicentre Growth Reference Study: Planning, study design, and methodology', *Food & Nutrition Bulletin* 25, no. 1 (2004).
[66] 'The WHO Multicentre Growth Reference Study', 20.

for growth', meant that the data came from a very restricted pool of people. This reference population were not average or normal in any way: they were ideal, representing the best way to bring up a child, the most favourable conditions for growth.

The creation of such an ideal had two effects. First, it revealed, even more than in previous reference populations, the extent to which 'normality' is constructed. Justified by producing a 'standard' rather than a 'reference', the MGRS involved even more work in the production of these statistics. To ensure that each child measured had been brought up in conditions 'optimal for growth', a lengthy screening and monitoring process had been adopted. By drawing data from six different countries, the creation of the data was also an even greater feat of organisation and communication, with data travelling across continents and standardisation sought in geographically dispersed locations. This makes it even more obvious how much work there is behind the production of a descriptive statistic and a declaration of what is normal. The WHO wanted to ensure only the 'right' kind of children were included in the sample, resulting in the manufacture of normality on an even greater scale.

But second, and far more importantly, the creation of the MGRS reveals the 'right' way to bring up a child, the optimal conditions for humanity. Embedded in this data is an explicit judgement about what kind of upbringing is good, and what is bad. The population measured were, in the end, drawn from the elite, whose environmental conditions were classed as 'optimal' and whose path of growth became exemplary. It is hard to disagree with these values in isolation, and the intention that lies behind them – after all, who wouldn't want to be brought up in an area with good hospitals, low infant mortality, and good access to clean drinking water? Who could disagree with the ideal of extending these benefits to everyone? But the effect of these

standards is to pathologise the majority of the world, to reinforce a value judgement equating stature with superiority and to justify a raft of new interventions on people.

Each of these claims needs further explanation. To take the first: the pathologisation of the majority. Unfortunately, conditions that are 'optimal for growth' are geographically and historically uncharacteristic. If we look at the way people have lived throughout history, and around the world, the majority will not meet the stringent conditions laid down as 'optimal for growth'. The motivation behind this ideal is noble, but the effect is dangerous: to ignore and dismiss the experiences of many people, who look different because they have grown up in different conditions. For example, the survey deliberately excluded communities who lived in high altitudes, in deserts, or in the rainforest, on the grounds that they live in a 'suboptimal' environment for growth. This meant that these people were not valid for comparison and their way of life was not to be emulated. The survey also allowed discretionary exclusion for children whose parents did not have 'sufficient education and income levels'. Again, this worrying phrase means that children born in certain homes could not be included in the data, and were excluded from the international standard. Moreover, there were more general exclusions: many children are not breastfed for twelve months, nor born between weeks 37 and 42 of pregnancy. The effect of the WHO standard is to compare everyone to an ideal, to stipulate in intricate detail the ideal way for us to be born, be fed, and to live.

At first glance, this complex system of exclusions begins to look a little like eugenics by another name. After all, both Galton and the WHO want to address the problems of weakness and small stature, they equate being bigger with being better, and they want to remove constraints to growth. A closer look, however, reveals profound differences between the two. Galton saw these constraints to growth as genetic or racial, but the WHO sees them as environmental. Galton wanted to

overcome the limited stature of the population by reproducing the genetic traits of selected people, but the WHO want to overcome them by transforming the conditions in which people live. Galton believed that stronger and taller children were intrinsically superior, whereas the WHO believes that height and strength are superior because they are reflective of a better underlying health. The two approaches are absolutely distinct, but there are, nevertheless, some similar implications: in both cases, to be stronger, taller and heavier is held up as an ideal and to be shorter, weaker and lighter is to be in need of improvement.[67]

This slightly simplifies the real aim of the WHO project, however, which is not to make everyone taller and stronger – which *was* the explicit aim of Galton – but rather to remove environmental constraints to growth. Its aim is not to make everyone taller, but to equalise the conditions in which children grow up, allowing people to 'reach their full genetic potential'.[68] In other words, the WHO is *not* passing a judgement on people who are genetically predisposed to be short. It is not saying it is better to be tall, or bad to be short (again, unlike Galton). It is, however, passing a judgement on situations leading to stunting; it is suggesting that childhood hunger is unacceptable if it leads to poor growth, and that intervention is necessary. This seems eminently sensible, but all the same, some scholars have argued that stunting is not a long-term problem, and that children who are stunted should not be pathologised or tainted with a sense of their misfortune. In what has become known as the 'small but

[67] The similarity between Galton's views and the aims of the WHO project can be demonstrated by a 2011 presentation by one of its main directors, Mercedes de Onis, who quoted Alfred Russel Wallace in connection with the survey. The quote by Wallace read: 'what we want is not a higher standard of perfection in a few, but a higher average, and this can best be produced by the elimination of the lowest of all and a free intermingling of the rest'. Wallace was a socialist and engaged critically with Galton, yet the essay from which this quote is taken advocated social engineering, recommending 'some form of selection' for the 'improvement of our race'. Alfred Russel Wallace, 'Human Selection', *Fortnightly Review* 48(1890): 328.

[68] Mercedes de Onis, 'Update on the implementation of the WHO child growth standards', *World review of nutrition and dietetics* 106 (2013): 75.

healthy' debate, which began in 1980, David Seckler argued that it is perfectly possible to be stunted by childhood hunger, but still to live a perfectly healthy life.[69]

Perhaps more interesting from a theoretical perspective, this approach leads to a division between genetic potential (which is to be respected) and environmental conditions (which are to be manipulated). This normative distinction is commonly accepted, but it is worth interrogating. In the view of the World Health Organization, genetic constraints on growth are acceptable, but environmental constraints are not: it is acceptable to adjust environmental conditions, but not to tamper with genetic ones. This is a standard position in socialist and social democratic politics: circumstances can be altered, so it is a matter of justice that they *are* altered, through taxation and redistribution, human rights, and public health, which can all adjust our environments and create some kind of equality of opportunity within society. But it is worth recognising that genes are no longer untouchable. They used to be out of bounds, but increasingly genetics *can* be adjusted. The argument that our environmental constraints are unchosen and so should be equalised can also apply to genetics. The lottery of our birth determines where we grow up, how rich our family is, how healthy and well-fed we will be; the distribution of these benefits is unfair and unrelated to our efforts, abilities and opportunities, which is why they should be equalised. But the same is true of the lottery of our genetics. I am certainly not making the case for genetic tampering, but simply asking why the WHO considers genetic potentials as

[69] David Seckler, '"Malnutrition": an intellectual odyssey', *Western Journal of Agricultural Economics* 5, no. 2 (1980); David Seckler, 'Small but healthy: a basic hypothesis in the theory, measurement and policy of malnutrition', in *Newer concepts in nutrition and their implications for policy*, ed. P. V. Sukhatme, (Pune: Maharashtra Association for the Cultivation of Science, 1982). This emerged into a vibrant debate. For an overview, see Ellen Messer, 'The 'small but healthy' hypothesis: Historical, political, and ecological influences on nutritional standards', *Human Ecology* 14, no. 1 (1986). For some of the opponents, see Reynaldo Martorell, 'Body Size, Adaptation and Function', *Human Organization* 48, no. 1 (1989); George Beaton, 'Small but Healthy? Are We Asking the Right Question?', *Human Organization* 48, no. 1 (1989); Gretel Pelto and Pertti Pelto, 'Small but Healthy? An Anthropological Perspective', *Human Organization* 48, no. 1 (1989); David Seckler, 'The 'Small but Healthy?' Hypothesis: A Reply to Critics', *Economic and Political Weekly* 19, no. 44 (1984).

sacrosanct and there to be protected, whilst nominating environmental conditions as circumstantial, which are there to be manipulated.

Whatever the answer to these uncomfortable questions, a particular ethical vision can be found here, embedded deep in 'neutral' and 'objective' practices. It is one where genetic potential is important to respect, but environmental conditions are open to manipulation. In one half of this conception, humans are genetically concrete – their heredity is there to be respected, their genetic makeup is to remain unchanged. But in the other half of this conception, humans are environmentally flexible – they are separable from their background, detachable from their circumstantial roots, free to be made and remade in isolation from geography and heritage. Here we have the modern view of humanity: not only are we able to float free from the ties and circumstances we are born with, but this is somehow to be expected. Human improvement *requires* the destruction of circumstance, the transcending of tradition, and the realisation of a potential that is built into human biology, into their genes. There is a persuasive normative argument for this kind of modernism, which has an attractive spirit of progressiveness and egalitarianism, but it is built on a modernist fiction: of rootless humans, who are genetically, but not environmentally, determined. It demonstrates the fundamentally modernist conceit underpinning humanitarianism. It reminds us that humanitarianism is persistently modern, that it is not neutral, but is built on a set of embedded assumptions, deep in its practices, which are there to be uncovered, interrogated, and disputed.

Implications for anthropometry

One of my central arguments is that food is a political issue. It cannot be allocated scientifically, because the way we measure hunger and the way we

distribute food sits on a mound of hidden assumptions. Even the idea of a 'normal' body is highly problematic, containing a series of embedded ideas about the right way to live and the parts of humanity that are open to manipulation. My aim in this chapter has not been to criticise these ideas, but merely to open up a space where they can be questioned. My intention has been to problematize the idea that there can be an objective approach to defining hunger and feeding the starving. I am certainly not suggesting that people should never intervene to change the environmental causes of suffering – in fact, my point is precisely the opposite: that *more* effort should be directed at changing structural conditions rather than treating the symptoms of these conditions through technical fixes like Plumpy'nut (which do no more than solve hunger in the short-term). But I believe that our interventions should take place on political rather than scientific terrain. We should address people's suffering by political mobilisation, not nutritional programmes that appeal to objectivity and normality.

Giving people food when they need it – or, even better, giving them the means to acquire the food they need – is about correcting an injustice. It is not about 'removing environmental constraints to growth'. It is a political act, which helps people fulfil the most basic element of their social and cultural lives. It is not about enabling them to 'realise their genetic potential', reach a 'normal' size and shape, or bring their bodies in line with a carefully selected sample of privileged individuals. This is the problem with nutritional anthropometry: it reduces a highly complex and politically charged situation into an objective procedure, which actually closes off political engagement from the people who are lining up and being measured. The basic assumption behind all uses of anthropometry is that the body can reveal a host of further information about the person – from the moral characteristics that were thought to emerge from anthropometric studies of criminals, the racial characteristics

that were thought to emerge from studies of physical anthropology, to the nutritional characteristics emerging from 'auxiological epidemiology'. In this chapter I have shown how all these uses of anthropometry are built on different political commitments. I have argued that the political commitments underpinning nutritional anthropometry can be extremely radical (particularly its egalitarian, universalist components), but, ultimately, there is far more to our quality of life than body shape.

In 1972, Donald McLaren suggested something called the 'Somatic Quotient'.[70] This was to be the ultimate indicator of malnutrition: a single number that amalgamated all the main anthropometric measurements into one. His suggestion was that the weight, height, head circumference and arm circumference should all be combined into a single score, in which the number 100 was equivalent to the median value (i.e. the 50th percentile of the standard or reference data). This was similar to the operations of the Intelligence Quotient, or IQ, which McLaren was trying to emulate – except his score would be a measure of the body, not the mind. McLaren suggested that nutritionists and psychologists could work closer together, producing two scores to track the development of each child. Psychologists could track the mental development using IQ, and nutritionist could track the physical development using the SQ. The aim was to standardise all measurements, and produce the ultimate, objective measure of comparison.

Donald McLaren was the author of the 'Great Protein Fiasco', the article that did more than anything else to expose the politics lying beneath the most mainstream nutritional policy of the 1950s and 1960s.[71] His aim in developing the SQ was to come to understand the true effects of malnutrition on the life of a child. Yet this measure encapsulates all that was wrong with nutritional anthropometry. It may have

[70] Donald McLaren and Abdallah Kanawati, 'A somatic quotient', *The American Journal of Clinical Nutrition* 25, no. 4 (1972). Somatic as in 'of the body', derived from Greek.
[71] This was the widespread idea of a 'protein gap', which I discuss in chapter seven. McLaren, 'The great protein fiasco'.

been based on the radical universal idea that everyone can be compared, but it sought to standardise and homogenise mental and physical development, applying a universal measure to radically different environments, aspirations, and 'goods'. It may have been devised to help change the structural conditions that made people hungry, but it defined hungry in a limited, physical way, giving people no chance to express how they felt. The idea of reducing wellbeing to a single number is just as ridiculous as reducing intelligence to a number. The absurdity of the IQ lies in its reductiveness: it assumes there is single, mutable intelligence rather than (as Howard Gardner argues), multiple intelligences.[72] The same is true of the Somatic Quotient: it reduces a complex set of conditions to a single number, it assumes that these can be compared, and it does all this relatively passively, offering the subject only a limited involvement in the expert's diagnosis.[73]

[72] Howard Gardner, *Frames of mind: the theory of multiple intelligences* (London: Heinemann, 1984).
[73] Twenty years later, McLaren was still advocating the Somatic Quotient, suggesting that the percentage scale was 'a goal well worth reaching'. McLaren, 'A fresh look at anthropometric classification schemes in Protein-Energy Malnutrition', 279.

9.

Conclusions

When I began this research I had two main aims. One was to address the comparative absence of historical literature on humanitarianism, and the other was to understand the emergence of technical practices and their associated politics. In 2009, there was no work of history that examined the full sweep of humanitarian history. Although there were texts that looked at the history of certain institutions or conflicts, and fascinating accounts of relief in a narrow historical timeframe, there were very few narratives encompassing the wider sweep of humanitarian history: the things that linked the provision of basic aid from the 19th Century battlefields of Solferino to the mountains of the twenty-first century Hindu Kush.[1] Whilst I was researching this thesis, Michael Barnett's book *Empire of Humanity* was published, which created an ambitious narrative, but this reaffirmed the more significant absence in scholarly literature: the lack of understanding about the history of everyday, technical practices.[2]

Having worked for some years in international aid, I was aware that the sector had become less flexible, less creative, and far more standardised at the end of the twentieth century – something reinforced by the multiple handbooks and guidelines I was asked to read whilst training to be a manager, combined with the wistful reminisces of senior colleagues, who remembered a less rigid time. The lack of historical awareness amongst humanitarian practitioners had always

[1] Some potted histories could be found in the openings of more general books, such as De Waal, *Famine crimes*; and Larry Minear and Thomas George Weiss, *Mercy under fire: war and the global humanitarian community* (Oxford: Westview Press, 1995); as well as in certain journal articles, such as Patrick Aeberhard, 'A Historical Survey of Humanitarian Action', *Health and Human Rights* 2, no. 1 (1996).
[2] Barnett, *Empire of humanity*. See also my discussion of Barnett's book in chapter one.

fascinated me – many of my colleagues had no idea when the techniques they used were developed and why – but this was unsurprising, since no-one had much time for critical reflection, tethered as they were to a funding cycle that forever asked them to prove their efficiency and effectiveness, rather than questioning the way things were done. The appearance of Barnett's book convinced me that this lack of knowledge about humanitarian techniques went deeper. His book focussed on the emergence of institutional politics and overarching principles, not on the nitty gritty of humanitarian practice. It seemed that a gap in technical histories also extended to the academic literature, which convinced me to concentrate on the practical details of aid work: the specific approaches adopted when humanitarians reached a disaster and began to take action.

The broad research question that guided my work, therefore, became 'how did humanitarians relieve suffering in the past?', or 'what techniques did they use when arriving at a recent disaster?' My approach to this question, moreover, was not to understand a specific era in its own terms, but to relate it to current practice. In many ways, I was following the classical question of historical sociology: 'why do we do things in these particular ways rather than others?' or, 'what are the historical antecedents of our current arrangements?' Answering this question was not just of academic interest, documenting a historical story that had not yet been widely examined. It was also motivated by a practical concern: showing that the way we do things was not inevitable or necessary, but that it emerged from particular historical conditions. To put it another way, I wanted to show the residues of the past in our current practice; I wanted to show the embedded norms and historical contingencies in these techniques, which were generally accepted without question.

This approach – of questioning the objective, taken-for-granted nature of humanitarianism – also related to one of the most dominant debates in the literature, which surrounded the 'classical' humanitarian principles.[3] The ideals of neutrality, impartiality, independence, and autonomy, which were originally enshrined by the Red Cross movement, revolve around an assumed separation between the 'humanitarian' and the 'political' – a highly problematic bifurcation in which humanitarianism is characterised as value-driven, and politics as interest-driven; humanitarianism as impartial and politics as partial; humanitarianism as neutral, and politics as partisan. It suggests that if only humanitarians can separate themselves from politics and insist on their neutrality then their work will be more effective and more moral. The idea was colourfully summarised by Jean Pictet, who wrote the definitive statement of classical principles, *The fundamental principles of the Red Cross*, declaring that humanitarians should 'beware of politics as they would of poison, for it threatens their very lives'. Mixing his metaphors rather alarmingly, he went on: 'Like a swimmer, [the ICRC] is in politics up to its neck, [but] also like the swimmer, who advances in the water but who drowns if he swallows it, the ICRC must reckon with politics without becoming a part of it.'[4]

A political argument

The first main argument of this thesis is to oppose this 'classical' articulation of humanitarianism. Since the early 1990s, a number of studies have established that aid inevitably has political consequences, citing its effects on the

[3] For an overview of these principles, see Weiss, 'Principles, politics, and humanitarian action'.
[4] Pictet, *The fundamental principles of the Red Cross*, 56, 59.

economy and its influence over institutions, but much of this debate has taken place on normative terrain.[5] Many authors have questioned the desirability of classical principles rather than their viability, and particularly after the debacle of post-genocide relief in Rwanda, there was a concerted move away from classical humanitarianism towards one shaped more by human rights. This 'new' humanitarianism advocated something more muscular, more explicitly concerned with the rights and wrongs of any particular conflict; it was a far more interventionist kind of relief, which moved away from attempts to be impartial, neutral and independent.[6] Its advocates argued that classical principles were less, not more, moral, and that they tended to make no distinction between the *genocidaires* and those being killed, whilst passively letting aid get manipulated by the most ruthless warring parties.[7]

This thesis has not taken up this normative case against classical humanitarianism, but instead has made an empirical, historical claim. My opposition to classical principles is not so much that they are undesirable, but rather that they are based on a fiction. Like Latour's argument in *We Have Never Been Modern,* I have suggested that we cannot separate politics from humanitarian relief; we cannot have purely objective, scientific systems for aid, in which human foibles, interests and imperfections are isolated from the measurement of physical needs and the provision of basic resources. The division between the 'humanitarian' and the 'political' is a typical modernist purification,

[5] For studies regarding the consequences of aid, see De Waal, *Famine crimes*; and Keen, *The benefits of famine*; for the ethical side of this debate, see Slim, 'Relief agencies and moral standing in war'; Weiss, 'Principles, politics, and humanitarian action'.
[6] An excellent overview of 'new' humanitarianism can be found in Chandler, 'The road to military humanitarianism'. The archetypal 'new' humanitarian position is that advocated by Bernard Kouchner, one of the founders of MSF, but it is not really 'new' at all, since, as Chandler points out, its roots can arguably be located in the Biafran war.
[7] For a qualified defence of classical humanitarianism against this critique, see Terry, *Condemned to repeat?*

in which the natural, eternal, physical facts of human need are separated from the cultural, sociological, and changing cultural manifestations of hunger and diet. In problematizing this purification, I have pointed to the way politics enters into seemingly objective humanitarian procedures, suggesting that 'scientific' humanitarian practices emerge from some quite explicitly political visions about the world.

In making this case, my aim has been to question the 'retreat into technocracy', which became the dominant response to the crisis of the 1990s. After the humanitarian catastrophe in the Rwandan refugee camps of central Africa, there was a period of self-examination amongst humanitarians, with a number of suggestions of how to improve the world of relief.[8] On the one hand, it gave impetus to the human rights-influenced 'new' humanitarians, as well as generating Alex de Waal's famous critique of neutrality.[9] On the other hand, it led to a move towards professionalization and standardisation: one outcome of the crisis was the massive inter-agency report on Rwanda, which generated initiatives such as the Sphere project, the Humanitarian Accountability Project, and the code of conduct produced by People in Aid.[10] These guidelines and handbooks, which emerged with great regularity after the Rwandan crisis, were accompanied by the idea that the failures of relief could be rectified by technocratic rather than political means. In many ways, this was the polar opposite of the argument made

[8] A good overview of the source of this introspection can be found in Storey, 'Non-neutral humanitarianism'.
[9] Omaar and De Waal, 'Humanitarianism unbound?'. This perspective was later worked into De Waal, *Famine crimes*.
[10] Howard Adelman et al., *The international response to conflict and genocide, lessons from the Rwanda experience* (Copenhagen: Joint Evaluation of Emergency Assistance to Rwanda (JEEAR) Steering Committee, 1996). For a commentary on the inter-agency report on humanitarian relief, see Joanna Macrae, 'Editorial: Multi-donor evaluation of Rwanda', *Disasters* 20, no. 4 (1996). For the story of the Sphere handbook, see Walker and Purdin, 'Birthing Sphere'. For a sense of the handbooks that emerged from this period, see Sphere Project, *Humanitarian Charter and Minimum Standards in Disaster Response*; Humanitarian Accountability Project, *A guide to the Humanitarian Accountability Project (HAP) standard*.

by Alex De Waal. De Waal had suggested that humanitarians needed to become more political, but the aid agencies were becoming less political.[11] De Waal criticised the unthinking reduction of crises to a population of bodies that needed feeding and sheltering, but the aid agencies were developing technocratic handbooks that produced better-structured, more efficient methods for sheltering and feeding bodies.

This thesis can be read as a critique of these technocratic guidelines, but not in failing to meet their stated aims. In a significant way, aid *has* become more efficient and standardised, and it is implemented on a much larger scale than ever before. This can be seen as a triumph for technocracy, but it has come at a cost. First, it led to what I call, below, the tragedy of modern bureaucratic humanitarianism, in which compassion becomes translated into an impersonal procedure, physical needs dominate social needs, and humanitarians become technocrats, reduced to implementing standardised relief over vastly different cultural contexts. Second, it is built on a mistaken idea: that by retreating into technocracy, it might be possible to prevent politics leaking into the humanitarian endeavour. This belief, I have argued, is a fiction. Politics exists not just in the effects of aid – in the way it contributes to the war economy, for example, or its effects on local institutions – but also in its micro-level practices. By focusing on humanitarian nutrition, particularly the emergency procedures involved in measuring hunger and feeding the starving, this thesis has illustrated how humanitarianism emerges from a political history, based on practices inherited

[11] MSF could be seen as an exception to this trend, since they rejected the standardising approach of the Sphere project and became far more strident in their political activism. For their response to Sphere, see Jacqui Tong, 'Questionable accountability: MSF and Sphere in 2003', *Disasters* 28, no. 2 (2004). For an example of their activism, see Weissman et al., *In the shadow of 'just' wars: violence, politics and humanitarian action*. Yet their work is just as heavy with procedure and protocol as any other agency.

from the military, ideas absorbed from mid-century high modernism, ways of looking at hunger that come from medical studies, and the implications of statistics and the market. In many ways, my argument in this thesis can be seen as a response to Peter Redfield's position, that humanitarianism in its short-term, medical guise constitutes a form of 'minimalist biopolitics', or a kind of 'non-ideological' position. My contention is that there is a maximalist political agenda underneath humanitarianism, and that even short-term relief is sodden with ideology.[12]

A sociological argument

These themes constitute the second main argument of this thesis, which is more sociological, and more specific to nutrition. When I began this research I did not set out to look so narrowly at nutrition, but rather to take the three most fundamental areas of humanitarian practice and consider them together: nutrition, shelter, and sanitation. Very soon, however, I realised such an idea was too ambitious, and there was enough complexity and interest in the story of humanitarian nutrition alone; I dropped my study of the other sectors and looked specifically at the emergence of nutritional techniques.[13]

The argument above (that humanitarianism can never be apolitical) is a general one; it could equally apply to other sectors, whose own retreat into technocracy could be questioned. The other arguments made in this thesis,

[12] See Redfield, *Life in crisis: the ethical journey of Doctors without Borders*. For a longer version of my response, see Tom Scott-Smith, 'Review: Life in Crisis: The Ethical Journey of Doctors Without Borders. By Peter Redfield', *Journal of Refugee Studies* 26, no. 2 (2013).
[13] My M.Phil thesis contained a residue of this earlier work, focusing on sanitation as well as nutrition. See Tom Scott-Smith, 'Food, water and modernity: a historical sociology of humanitarian relief', unpublished M.Phil thesis, Oxford, UK, 2011.

however, are constructed from historical texts, and apply more specifically to nutrition. In part II of this thesis, for example, I looked at emergency feeding, arguing that these were shaped by military practices, modernist practices, and the market. In part III, I looked at the measurement of hunger, arguing that these were influenced by statistical methods and an obsession with physiological detail. This is not to say that such themes are not present in the other sectors – indeed, I found a lot of evidence to suggest that camp planning, for example, was equally influenced by a militaristic desire for order and control, and that shelter designs also contained an indelible element of modernism. The point, however, is that the evidence I have presented here can only make such a case for humanitarian *nutrition*.

A brief synopsis of my thesis will help to clarify these themes. In chapter two, I offered a sketch of contemporary humanitarian nutrition, focusing on two separate procedures. The first was a screening process, in which anthropometric measurements of the upper arm were used to determine eligibility for food. The second was a feeding process, in which fortified flours were distributed in a closely ordered space. These two elements of emergency nutrition then became the focus of the subsequent historical material: part II of the thesis, entitled 'providing for the body', looked at the history of fortified foods, and part III of the thesis, entitled 'making hunger visible', looked at the history of anthropometric instruments. Each of these parts was divided into several chapters.

The history of fortified foods was divided into three chapters. The first looked at the period before and immediately after the Second World War, pulling out the theme of *militarism*. The second looked at the period between the 1950s and the 1970s, pulling out the theme of *modernity*. The third did not look

specifically at a given era, but focused on the theme of commercialism, or, the *market*. The argument in these chapters was that militarism, modernity and the market were not just dominant themes of humanitarian operations in the past, but that they also shaped the emergency feeding in the present.

Chapter four, for example, gathered evidence from relief worker memoirs, post-war humanitarian handbooks, archival correspondence and newspaper reports to show how order, efficiency and mobility were core characteristics of relief in this era. In this chapter I looked at the distribution of spam, Maltavena, and vitamin pills; I examined the careful ordering of soup kitchens; and I showed how calories were carefully counted in the calculation of rations. My argument was partly that these features constituted a military-influenced approach to relief – a position bolstered by the degree of interaction between humanitarian and military practices – but also that these features remain in the present. In other words, my argument was not just historical, but also historically sociological; it was not just that there was a military-influenced era of relief that had order, efficiency and mobility as its key concerns, but also that these features also shape contemporary relief, and are identifiable in contemporary handbooks and refugee camps like Yusuf Batil.

Chapter five had a similar structure. Drawing on scientific journal articles, aid agency reports, and evaluations from the mid-twentieth century, this chapter argued that humanitarian nutrition in the 1950s and 1960s was heavily influenced by high modernist ideas and approaches. In this chapter, I looked at the search for new protein sources, focusing on Single Cell Protein, Leaf Protein Concentrate, and algae. I looked at the rise of fortified flours such as Incaparina, and Corn-Soy Blend. I argued that these schemes required major changes to how people eat;

they sought to re-make the world. By taming nature and manufacturing nutritionally balanced wonder-foods, they swept away the irrationalities of cultural practice and the inefficiencies of traditional crops, promising a world without malnutrition. Again, I argued not just that the modernist ideal motivated humanitarians in the past, but also that it influences it in the present. I ended the chapter by indicating that high modernism ostensibly ended in the mid-1970s, but that this idea of the perfectly packaged miracle foods lives on, and we can see it in items such as Plumpy'nut and the continued dominance of fortified flours.

The persistence of modernism, in many ways, is a broader theme in this thesis. Modernity, without a doubt, influenced the army handbooks, with their preoccupations with order, efficiency and mobility, and it self-evidently shaped the search for humanitarian wonder products. It also shaped the third theme in part II: commerce. In chapter six, I looked at how commercial concerns shaped humanitarian relief. I looked at the private companies that became involved in the production of high-protein foods, and traced how these were promoted to aid agencies and the poor. I showed that these foods were often made from the cheap, readily available residues of other industrial processes, from the palatable (such as dried milk, which was a residue of the butter industry), to the unpalatable (such as Fish Protein Concentrate, which was made from the offal of junk fish). Finally, this chapter showed how famine foods fitted into an increasingly globalised system of food production, generated from the massive agricultural surpluses of a few basic commodities, principally wheat, soya, and corn. This modern system of agriculture, distribution, and marketing, I argued, has shaped the character of relief.

Part III of this thesis turned from emergency foods to anthropometric measurements. Its emphasis was not on how people were fed in emergencies, but on how hunger could be measured. After explaining how hunger could be 'made visible' through a number of mechanisms (such as clinical examinations, dietary surveys, and biochemical tests), it focused on anthropometric measurement, which is by far the most dominant technique in disasters. This part of the thesis was divided into two chapters, each of which examined a different theme. The first chapter examined the power of specifics: the way that medical experiments on starving bodies led to an accumulation of detail on the physiological experience of starvation. The second chapter examined the power of statistics: the triumph of a universal approach to humanity, which allowed bodies of different races to be compared. The argument in both chapters was, once again, that these themes – statistics and specifics – constituted the pre-requisites for anthropometry, shaping this particular approach to 'making hunger visible'. But I also suggested that they continue to shape the character of humanitarianism: aid workers still have ways of dividing hunger into types, relying on statistical techniques.

Chapter seven examined the medicalization of hunger. Drawing primarily on scientific papers from the 1930s and 1940s, this chapter described three starvation studies: the discovery of kwashiorkor by Cicely Williams, the 'hunger disease' studies from the Warsaw Ghetto, and the Minnesota starvation experiment led by Ancel Keys. It argued that these studies, which all took place between 1930 and 1950, shared a number of key characteristics: they all sought intricate physical details about the deterioration of the starving body, they all focused attention at the level of cells and nutrients, and they all implied that true

malnourishment took place deep inside the physique. I argued that this was a distinct historical shift, reconfiguring the meaning of hunger. In these studies, hunger became a biochemical deficiency more than a social situation; it became amenable to a technical solution rather than a structural, political one. Most importantly, it laid the ground for anthropometry, which became a way to make visible what could not otherwise be seen. The body's underlying biochemical condition became 'true' malnourishment, and anthropometry became the most scientific way to reveal this condition in the resource-poor circumstances of a humanitarian emergency.

Chapter eight then turned to the next main precondition for anthropometry – statistics. It argued that universality and normality allowed anthropometry to work: the first enabled bodies to be compared with one another, and the second produced a standard for judgement. The chapter began by tracing the triumph of universality. By comparing the work of Carlton Coon and E.J Bigwood, I showed that anthropometric measurements were used for many purposes until the middle of the twentieth century: Coon used anthropometry to produce a taxonomy of human difference, whereas Bigwood used it to demonstrate the plasticity of the human form. By the middle of the 1960s, however, Coon's racist application of anthropometry had been thoroughly discredited, and it became possible to compare body shapes from around the world with a notion of normality – a statistical idea that was produced by amalgamating bodily measures into reference data. The second half of this chapter examined how these data were produced and 'normality' made. I argued that this held up certain kinds of society to be emulated, whilst excluding others from its calculations. It was a modernist political vision, separating people from their background, detaching them from

their circumstantial roots, and producing rootless humans, who were genetically, but not environmentally, determined.

A historical argument

It is not really very original to point out that humanitarianism is a product of the modern age. In the vibrant historiographical debate about its origins, authors stress a different component of 19th Century modernity in explaining the sudden rise in humanitarian sentiments. Thomas Haskell, for example, links the emergence of humanitarianism with the rise of market capitalism.[14] Frank Prochaska locates it in moral progress and enlightenment values.[15] Gareth Stedman Jones associates it with industrialisation and the need for tools of social control, and Thomas Lacqueur connects it with the novel and the detailed narratives of suffering bodies.[16] Whichever interpretation we prefer, these humanitarian sensibilities undoubtedly required modern technologies to transform them into action: without print capitalism, canned foods and communication systems, it would be impossible to relieve distant distress, even if there was already a transnational sensibility upon which one could draw.

Modernity, as should now be clear, is also a recurring thread in this thesis: the nutritional techniques I examined have all been connected to modernist themes. Without nutritional science, food technology, and the biochemical interpretation of hunger, humanitarian nutrition would be unthinkable. Moreover,

[14] Haskell, 'Capitalism and the origins of humanitarian sensibility, part one'. See also John Ashworth, 'The relationship between capitalism and humanitarianism', *The American Historical Review* 92, no. 4 (1987).
[15] Prochaska, 'Philanthropy'.
[16] Jones, *Outcast London: a study in the relationship between classes in Victorian society*; Laqueur, 'Bodies, details, and the humanitarian narrative'.

each sociological theme has been underpinned by modernism. In the story of emergency foods, I looked at military efficiency, space-age rations, and commercial imperatives.[17] In the story of nutritional anthropometry, I looked at normality, universality and statistical techniques.[18] From these roots, humanitarian nutrition also contains the ingredients of modernist politics: notions of progress, formal equality, and – to return to Latour again – the purification of society and nature. Despite its professions of neutrality and objectivity, there is a distinctive political project as well as a set of contingent sociological themes in the story of humanitarian practice.

This leads to my third main argument, which is explicitly historical. The focus of this research has been the mid-twentieth century, between the early 1930s and the middle of the 1970s. This, I have argued, has been a formative era for humanitarian nutrition. By the time of Biafra, most of the main features of the humanitarian nutritional regime were in place. Anthropometry, for example, had by then become the accepted method for screening malnourished children, and fortified foods had become common – with CSM used for the first time. I illustrated this in the introductions to part II and III, which compared contemporary descriptions of nutritional relief during the Nigerian civil war with the feeding techniques in Yusuf Batil. To put it succinctly, the main components of our contemporary nutritional system were already in place by the end of the 1960s: the anthropometric screening, the fortified foods, and even the detailed

[17] The connection between medicine, war and modernity has already been explored in a fascinating volume. Roger Cooter, Mark Harrison, and Steve Sturdy, eds., *War, medicine and modernity*, (Stroud: Sutton, 1998). See also Mark Harrison, 'The medicalization of war - the militarization of medicine', *Social History of Medicine* 9, no. 2 (1996). There are many connections between this work and my own study.

[18] And normality, as Ian Hacking has said, 'bears the stamp of the nineteenth Century and its conception of progress'. Hacking, *The taming of chance*, 161.

procedures in which these techniques were inserted had become relatively stable features of humanitarianism.

This has a number of implications for the way we understand relief. First, it shatters the myth that there is something revolutionary or unique about recent miracle cures, such as Plumpy'nut. There has been an huge amount of excitement over this sachet of peanut paste, which has been portrayed in the media and by relief workers as 'an immunisation' against malnutrition, a 'magic' commodity invented by a French scientist during a 'eureka moment', which results in the 'miraculous' transformation of children 'from literally skin and bones to certain survival in just four to six weeks'.[19] A similar response has greeted other recent initiatives, such as Sprinkles, a micronutrient powder for scattering on food, which boosts its nutritional value. This has been hailed as a great new invention, which is akin to GPS in its transformational impact.[20] This lionisation of nutritional products tends to present them as rootless, recent discoveries, when in fact they are tired manipulations of age-old ideas. 'Sprinkles' is yet another magical fairy dust, which promises to transform a meagre diet into something acceptable – it is startlingly similar to Incaparina, an earlier technical fix that offered a similarly limited vision. Plumpy'nut is based on long-standing ideas of a durable, energy-dense, carefully packaged food – less unique than often suggested, it is just fortified peanut butter in a packet, some way between a biscuit and a milk-based formula.[21]

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[19] Andrew Rice, 'The peanut solution', *New York Times*, 5 September 2010. Another correspondent wrote: 'Plumpy'nut is a beige paste about as thick as mashed potatoes and stuffed with milk, vitamins and minerals… but that is akin to calling a 1945 Mouton Rothschild fortified grape juice'. Michael Wines, 'Hope for hungry children, arriving in a foil packet', *New York Times,* 8 August 2005.

[20] Sam Loewenberg, 'Easier than taking vitamins', *New York Times*, September 5, 2012.

[21] In other words, Plumpy'nut contains no magical or unusual ingredients: just peanuts, vegetable fat and dried milk, which have been used in emergency foods for a long time (its inventor, André

The second implication follows from this similarity between contemporary schemes and historical relief: it suggests that humanitarianism is persistently modern, trapped by a mid-century faith in technology, order and progress. This interpretation is a departure from recent scholarly work, which has identified a *post*modern trend in humanitarian assistance. Mark Duffield, for example, has suggested that *resilience* has become the central organising principle in contemporary aid: a shift from older, more modernist arrangements.[22] Previously, humanitarianism was about protecting society from disaster. It involved large, centralised schemes, which paternalistically assisted people in crisis, 'walling off' external events that interrupted the path to progress. Resilience, however, shifts the emphasis to self-reliance and self-government. Now, disaster is not presented as an unexpected obstacle to progress, but as an inevitable part of the human condition. People have to accept the inevitability of disaster and learn to help themselves through it. Where once there was protection and assistance, now there is preparation for exposure.

This is a persuasive idea, but it ignores the reality of humanitarianism in practice. Resilience may be *de rigueur* in policy documents, but it is not yet reflected on the ground. Planned, centralised, top-down relief remains the most common form of assistance, and the number of technical guidelines for humanitarians has expanded, not contracted in recent years. In this thesis I have argued that humanitarian nutrition remains carefully planned, persistently paternalistic, relentlessly modern. The ordered grids of refugee camps, for

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Briend, used to whip up this paste 'in the field' to demonstrate how easy it was to make). See Rice, 'The Peanut Solution', p. 36.

[22] Mark Duffield, 'Challenging environments: danger, resilience and the aid industry', *Security Dialogue* 43, no. 5 (2012). Mark Duffield, 'How did we become unprepared? From modernist to postmodernist conceptions of disaster', keynote address at conference *Humanitarianism: Past, Present and Future*, Humanitarian and Conflict Response Institute (HCRI), University of Manchester, 8-10 November, 2012.

example, show no sign of abating; regimented supplementary feeding programmes have not gone away. In many ways, the problem is not that there is too much self-help, but not enough. In contrast to Duffield's position, humanitarianism is not taking radical new forms, but sticking to a template that was developed half a century ago.

This argument can also be read in relation to Stephen Hopgood's provocative recent book on human rights, in which he identifies humanitarianism as one of the 'three braches of the humanist tree', representing a secular, universal, liberal ideal, which replaced religion as an article of faith in 19th Century Europe.[23] Hopgood's argument is not just that humanitarianism emerges from a fundamentally liberal, Western, tradition – a point that is mirrored in this thesis – but also that it is going through an inevitable decline. Echoing the argument previously made by Samuel Moyn, Hopgood suggests that human rights rose to prominence as a tool of Western foreign policy in the 1970s, associated with the politics of neoliberalism.[24] This was a departure, he argues, from earlier eras, in which human rights were more able to stand outside of prevailing regimes of power. In the contemporary world, however, there has been a renewed attack on human rights, which are correctly identified with the power of Western liberal states.[25] This attack has accompanied the shift of global power towards a multi-polar world. The 'endtimes' of human rights, in other words, represents the last stages of decolonisation, and so should be embraced rather than resisted, since it

[23] Hopgood, *The Endtimes of Human Rights*.
[24] Moyn, *The last utopia: human rights in history*; Hopgood, *The Endtimes of Human Rights*, chapter five.
[25] Hopgood makes a distinction between upper-case Human Rights, which are closely associated with American power, and lower-case human rights, which retain an oppositional, anti-hegemonic spirit.

offers the possibility of new, more localised and less compromised forms of emancipation.

Whether or not short-term humanitarian relief is going through its own endtimes is a matter of debate – and not one I can contribute to here.[26] But the material in this thesis certainly supports the view that humanitarianism is a thoroughly political project, which has its roots in Western history. In this sense, my story of humanitarian nutrition ties in with other studies of the 'humanist tree', but it contributes to this literature by offering a slight departure from the existing historical narrative. Samuel Moyn, Stephen Hopgood and others have suggested that the 1970s were a particularly important turning point in the formation of the human rights regime.[27] They argue that the 1970s saw the concept of human rights become associated with neoliberalism, democracy, and Western foreign policy, and its institutions become well-funded, professionalised, and dominated by effective publicity machines. My narrative, however, suggests that this process had already taken place by the 1970s. In humanitarian relief, professionalization and standardisation had begun by the Second World War, were well underway by the 1960s, and were largely completed by the time of the Biafran war.

At the very start of this thesis, I identified the bare bones of this argument. First, I suggested that the twentieth century had seen the rationalisation of food

[26] In support of the idea that humanitarianism is going through its own 'decolonization process' one can point to the rise of 'Southern' and faith-based humanitarianisms, and the increasing attacks on Western aid workers alongside their association with American power. On non-Western forms of humanitarianism, see Michael Barnett and Janice Gross Stein, eds., *Sacred aid: faith and humanitarianism*, (Oxford: Oxford University Press, 2012); Julia Pacitto and Elena Fiddian-Qasmiyeh, "Writing the 'other' into humanitarian discourse: framing theory and practice in South-South responses to forced displacement," in *New Issues in Refugee Research* (Oxford: Refugee Studies Centre, 2013); For more on the targeting of aid workers and their association with the West, see Laura Hammond, 'The power of holding humanitarianism hostage and the myth of protective principles', in *Humanitarianism in question: politics, power, ethics*, ed. Michael Barnett and Thomas Weiss, (Ithaca: Cornell University Press, 2008).

[27] Moyn, *The last utopia: human rights in history*, 1-8; Hopgood, *The Endtimes of Human Rights*, 98.

aid: with the rise of nutritional science, food was reduced to its component nutrients, hunger was condensed into a biochemical problem, and from being an act of personal compassion in the nineteenth century, aid became an efficient, bureaucratic procedure. Second, I suggested aid became individualised: at the start of the twentieth century, hunger was interpreted as a social experience, affecting whole communities, but by the middle of the twentieth century, humanitarians started focusing on individuals – their bodies, their needs – and food was packaged in personalised portions, with malnutrition perceived as a personal pathology, not a social concern. Finally, I suggested that humanitarianism became depoliticised: characterised by specialisation and professionalization, and dependent on protocol and expertise. In the sphere of nutrition, food was reconceived as medicine, and hunger as a disease, and humanitarian aid was transformed into a technical intervention: abstracted from its causes, unresponsive to its consequences, and, in the memorable words reported by David Rieff, akin to putting 'Band-Aids on malignant tumours'.[28]

These conclusions take me beyond the confines of this research project, but I suspect further study would support their relevance to other humanitarian sectors. Much of humanitarian relief seems to have became professionalised and standardised in the middle of the twentieth century, with Biafra as the turning point.[29] In relation to the work of Moyn and Hopgood, my findings indicate an interesting comparison: that humanitarianism was an early, rather than a late adopter of the individualising practices that took over the human rights movement in the 1970s. The shift to a more individualised, rationalised, technical and neoliberal approach grew from seeds that were sown long before, and the

[28] David Rieff, *A bed for the night: humanitarianism in crisis* (London: Vintage, 2002), 307.
[29] For more on the importance of Biafra as a historical turning point, see the introduction to Part II.

mythical 'golden age' of voluntaristic, non-professional humanitarianism – when aid workers had freedom to act, move around, and improvise, with minimal contact from head office – was always a fiction: a romantic portrayal of the recent past.

A theoretical argument

My historical argument is encapsulated in the title of this thesis: *defining hunger, redefining food*. During the middle of the twentieth century hunger became defined as a physical experience, and food was redefined as an assemblage of nutrients. This trend culminated in 1972, with two remarkable developments. First the commercial production of Single Cell Protein perfectly encapsulated the desire for a clean and controlled food source, grown in gleaming laboratories miles from the earthy irrationalities of traditional agriculture. Second, the Somatic Quotient amalgamated all the important anthropometric measurements into a single number – a physical equivalent of the Intelligence Quotient (or IQ). Here was the apex of the modernist dream. In the Somatic Quotient there was a single number that could capture a person's nutritional status, measured with scientific precision on the physical body. In Single Cell Protein there was the promise of an emergency ration that was not only protein rich, but which could tackle malnourishment with synthetic materials, manufactured in industrial plants. This moment represents the logical conclusion of the nutritional story: hunger defined physically, and food defined nutritionally.[30]

[30] Neither of these ideas came to final fruition: the Somatic Quotient was never adopted, and Single-Cell Proteins never had any use beyond animal feed (although they left some legacy in the

My theoretical argument is that this did not simply entail a particular perspective of food and hunger, but that it produced new objects in humanitarian intervention. Drawing on Bruno Latour and Annemarie Mol, I argued that hunger and food are not single entities, looked at differently from various perspectives, but that they are multiple: this is a philosophical, ontological argument. To put it another way, defining food nutritionally did not just entail a new perspective on food; it was a redefinition of what food actually was. I chose the term carefully – to define something is to mark its limits, to describe its scope and nature; it is to delineate a new object. The definition of food as nutrients and hunger as a physical shortfall in these nutrients was not just an original perspective on these objects; it was the production of something completely new. When the authors of the 1945 COBSRA *Handbook* stated that 'enough to eat does not mean enough bread, or enough soup, or enough potato; it means enough of each of the *nutrients* of which food is composed', they were articulating what by then had already become a new object for interventions: food not as social glue, cultural practice, ceremonial object, or even agricultural product, but food-as-nutrients.[31]

The same is true of hunger. Something new was created by the emergence of anthropometry, the rise in anatomical detail, and the compilation of reference data (which, I have argued, were all intricately related). Anthropometry did not represent a new perspective on a single external object, but the creation of something new. Despite the protestations that anthropometry was just an indication of an underlying, 'true', biochemical malnourishment, the act of measuring bodies and comparing these with a reference project defines hunger

meat-substitute Quorn, made using a similar process). These ideas, however, illustrate the implications of a modernist vision.

[31] 'Nutrition and relief work: a handbook for the guidance of relief workers', 19.

differently. To clarify this point once again, I am not just talking here about our *perspectives* on hunger and food; I am not saying that our *ideas* of hunger and food changed – although this is certainly true. My claim is also that the very materiality of hunger and food also changed – what hunger *is*, what food *is* underwent a transformation in the middle of the twentieth century. And to tie this to one of my earlier arguments, this was particularly influenced by modernism, which mistakenly purified the social and political values of food from their material manifestations.

A normative argument

So far in this conclusion, I have looked at four facets of my thesis – political, sociological, historical, and philosophical. Before wrapping up, I want to discuss a final, normative argument. At the start of this conclusion, I argued that the problem with classical humanitarianism was that it was based on a fiction: an apolitical ideal of neutrality and impartiality that was completely impossible to realise. My opposition to classical humanitarianism, I clarified, was empirical, not normative: based on its impossibility rather than its undesirability. This, however, should not be taken as an indication that I have no normative political agenda here. As I clarified in my theory chapter, I always intended to make a normative case in this thesis, especially since Latourian research often contains a problematic ethical ambivalence. With that in mind, I will end by tying my thesis to another body of work: the critique of nutritionism, which rejects the idea that foods can be reduced to nutrients, advocating, instead, a new understanding of our diet, which is placed in a wider context.

This critical literature has been highly activist, campaigning for a different relationship to the food we eat, and a new resistance to the food industry.[32] It argues that we need to think differently about food, moving away from 'food as nutrients', and connecting it instead to production in the fields and consumption in our homes. My contribution to this literature comes in two forms. First, I offer a stronger philosophical grounding to the idea that food and hunger have become understood differently in the twentieth century. As I have just pointed out, Latour and Mol help us present nutritionism not just as a restrictive perspective on food, but also as *productive*, generating entirely new objects that change our interventions. This leads to my second contribution, which is to extend the critique to humanitarianism. In this thesis, I have argued that the reduction of food to nutrients has not just affected the processed diets, health obsessions and supermarket-dominated economies in the rich world, but also the very poorest sectors of global society. By producing new objects (which we might call 'food-as-nutrients' and 'hunger-as-a-physiological-deficiency'), starving people in disasters have been acted upon differently. Through humanitarian aid, they have been subjected to a new way of measuring their needs, and become recipients of new foodstuffs that were designed to meet these needs.

The sceptical reader may wonder what on earth is wrong with all this. Why does it matter that starving people have their bodies measured, and are fed with nutritionally enhanced wonder foods? Is this really a problem if more lives are saved, more quickly, with less money? Hopefully, the content of this thesis has not detracted from the profound achievements of this approach. In chapter two, for example, I noted that disaster foods like Plumpy'nut are very good at

[32] Michael Pollan is the best proponent of this oppositional, activist spirit, especially with his book Pollan, *In defense of food: an eater's manifesto*.

rapidly putting weight on emaciated children, and that the MUAC process helps aid workers make extremely difficult decisions in pressurised environments. But I have also indicated the flip side of these technologies. The reduction of food to nutrients, for example, has placed control in the hands of experts, who calculate the value of foods in ways that are unfamiliar to many people around the world. 'Emergency feeding' takes power away from recipients, especially when they are not enabled to buy, grow and eat the foods they are used to. 'Wonder foods' represent a paucity of vision, which prioritise the nutritionally enhancement of gruels rather than changing the circumstances that condemn people to a terrible diet. The dominance of corn, soy and wheat plays into the hands of food corporations, and buttresses an unsustainable system of global food production. These 'wonder foods' are not even very nice: Plumpy'nut is successful perhaps because it is the least bad product in a terrible field, which includes the dry, tongue-grating, spit-sapping bulk of a *Compact* BP-5.[33]

The MUAC process also has problems. It objectifies people, giving them no space to articulate their feelings or experiences, and channelling the masses of starving bodies through a ruthless, impersonal production line. It relies on problematic cut-off points, which contain embedded value judgements about the right way to live. The whole construction of 'normality' is drawn from an elite, whose environmental conditions are classed as 'optimal' and whose path of growth is held up as exemplary. These cut-off points also risk abandoning people once they have recovered from extreme starvation: even after being objectively identified as 'adequately nourished', people may remain hungry, have insufficient

[33] The taste of emergency foods has certainly improved since the 1970s, when one aid worker confessed the need to 'simulate enjoyment' when testing food at distribution points. Higgins, 'Soy products in national and international programs: field and emergency programs', 144.

access to food, and suffer from the social problems accompanying widespread malnourishment. The MUAC process, moreover, is not even necessary: it is perfectly possible to identify the severely malnourished without silently lining people up and wrapping measuring tape around their bodies.

So there are good sides and bad sides to the system, and although this thesis should not be read as a simplistic denunciation, there is certainly plenty to critique. In many ways, what we find in the aid world is a tragedy rather than a crime – a tragedy of the rationalised, individualised, bureaucratic approach. In an ideal world, humanitarianism would not need to rely on technological objects like the MUAC band and Plumpy'nut. Aid agencies would address the structural causes of hunger, help people access the foods they normally eat, and be responsive to individual suffering. Yet the sheer quantity of need and the urgency of disaster create an environment for these bureaucratic techniques. Being sensitive to individual needs and cultural concerns becomes difficult, because saving the most lives is the aim. This is the tragedy of modern bureaucratic humanitarianism. It has long been recognised by aid workers – Florence Nightingale, who is sometimes seen as the first modern humanitarian, stressed the importance of responding to emotional as well as corporeal needs – and modern humanitarians still agonise over it, lamenting the impossibility of attending to so much suffering whilst extending care beyond the physique.[34] In the words of Tony Vaux:

> Aid that simply provides calories for the stomach and water for the throat is a reduction of people to things. How can there be human concern for such a mean objective? 'Concern for the person' entails concern for the whole being, including a person's state of mind, sense of loss and the

[34] Nightingale, *Notes on nursing*, 74.

> devaluation of life… It is a concern for every aspect of a person, including their loss of relatives and way of life, their disability, their love of children, their past and future. It involves the aid worker infinitely in deeper and deeper understanding.[35]

It would be wrong to suggest that individual humanitarians are technocrats, because Vaux's admirable motives are shared throughout the sector, yet these wonderful intentions get lost in a sea of troubles. The concrete reality of humanitarianism revolves around a minimalist logic – of lives saved and sustained – and objects embody this single-minded judgement of efficiency. Foods become nutrients, peanuts become medicine, and measuring tapes become a 'bracelet of life'. Objects are valued and success is declared based on the number of people assisted at the aggregate level. This is not to condemn the calculations, or lament the transformation of objects; it is to highlight the dogged judgement, which is based on efficiency rather than individual care.[36]

As a critical outsider spending several weeks in Yusuf Batil over the summer of 2012, it was hard not to reach some damning conclusions. I saw refugees shuffling through an amplified education programme in order to receive a couple of oily plastic bags filled with sweet, imported corn meal when they would rather have sorghum. I saw silent people lined up and measured with a strip of tape, when it was perfectly obvious who was really starving. I found lots of corn and soy – commodities that play an integral part in the global food system, erasing biodiversity and destroying the soil – when they are not even local staples.

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[35] Tony Vaux, *The selfish altruist: relief work in famine and war* (London: Earthscan, 2001), 7-8. This theme constantly reappears in the memoirs of aid workers. For a good recent example, see James Maskalyk, *Six months in Sudan: a young doctor in a war-torn village* (Edinburgh: Canongate, 2010).

[36] I have explored this issue at greater length in a journal article, from which this paragraph is taken. Tom Scott-Smith, 'The fetishism of humanitarian objects and the management of malnutrition in emergencies', *Third World Quarterly* 34, no. 5 (2013).

I found nutritionists tinkering with the nutrient profile of these commodities by fortifying and processing them, whilst thousands of people lacked their usual diet. I also found miles of fertile land around the camp with nothing being planted or grown, whilst requests for seeds, tools, and space were barely acknowledged, and in the few weeks I was in the camp, a corn plant shot up outside my own tent.[37]

This thesis should not be taken as a critique of humanitarian ideals, nor with the act of distributing food and other forms of assistance when people need it. Like most people, I revere such deeds, even if I am nostalgic for a mythical version of humanitarianism with an uncomplicated purity. The target of my criticism is the way this ideal has become translated in a bureaucratic world. I am critical not of the act of giving food, but of the ways this is done, and, in particular, with the procedures attached to nutritionism: the organisation of bodies and the distribution of balanced fortified foods, which I believe adds little to stopping hunger, and simultaneously depoliticises it, taking power and awareness out of the hands of hungry people, concentrating it in the hands of nutritionists.

The bottom line is that people do not starve and suffer because they lack nutrients. They starve and suffer because they lack food. Experts are not needed to come and tell them what their body lacks and how best to provide what is missing, because, if given the resources, people can provide what they need. They can survive (as they have survived for hundreds of years) on their traditional diets, without the food technologist and the nutritionist telling them how hungry they are, or what they need to eat. Even when nutritionists recognise this, they defend their work as a stopgap, a temporary measure. It is simply indulgent, they say, to

[37] In this context, the distribution of food that is milled and pre-cooked in the USA seems especially bizarre. Camps like Yusuf Batil contain thousands of people, who have plenty of time, and a real desire to cultivate land, but they are often left dependent on a tightly controlled distribution of imported food.

criticise our methods on grounds of unsustainability, relationship with the global food system, for being short term, or for silencing the voices of the starving, because people are dying and they need sustenance: rapidly, efficiently and viably. We know that hunger is political, they say; that starvation is the result of many factors; that dearth is experienced socially; that food has social roles; that long-term responses to suffering should tackle root causes and help people to be independent. But there is not time for any of this, because we are dealing with an emergency.

In the end, it is this idea of 'emergency' that really needs to be interrogated because it has become an obstacle to change. Emergency is a construct, a social declaration, which enables some things and prevents others. There are, of course, some situations where there really is no alternative to imported, portable sachets of fortified peanut paste, where there are no local staples available, or when people simply cannot help themselves. But thankfully, these situations are relatively rare. Most of the time humanitarians are burdened with a standardised template, which is applied to vastly different environments, often when people are far from helpless. We need to resist labelling these situations as 'emergencies'. If we really want to help people, we should stop declaring their situation as exceptional, but instead sit down, take time, and look for more creative ways to help them secure the foods and futures they desire – even if this does not fit into the structured, bureaucratic system that has now been in place for close to a century.

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