

1 **On the omnipresence, diversity, and elusiveness of values in the life sciences and medicine**

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Valuations of life are intermingled with values such as scientific reputation, profitability, fairness, economic efficiency, and accessibility of care. Reciprocally, the practices of the life sciences themselves produce values, for instance: public health, the preservation of endangered species, profitability of tamed animals for farming, usability of clinical data, or bodily autonomy.

Scientists, regulators, analysts, and publics regularly strive to define what counts as proper conduct in science and health care, what is economically and socially valuable, and what is known and worth knowing. The life sciences, and the biomedicalization of human life more generally, are an historically increasingly important site for the production of life forms and of culturally available meanings and orderings of life—not least of social life (Clarke et al. 2003). In the crucible of day-to-day practice, we face decisions that assemble the value of things, humans, and animals in certain ways.

So we need to ask: How are values made and ordered? What determines what comes to count as important values in a given setting? What actors are allowed to make values and yardsticks, and with what means? How are metrics agreed upon? Which values are put into play? How are a multitude of possible divergent values coordinated or separated in practice?

The social and material orderings of the life sciences and health care are permeated with the making, attribution, and performance of different values: cultural, economic, legal. Our aim in this volume is to examine the ongoing composition of these values in the life sciences. We do this using a broad approach that does not treat values as stable and predefined, but rather as something grappled with, articulated, and made in concrete practices. By looking at dissonances, discordances, and ruptures between values, we find situations of the explicit assembling, articulation, coordination, and negotiation

of values. These practices illuminate the various yardsticks, different technologies, and matters of concern that inform these mundane, but fundamental, activities.

In this volume we use a broad definition of the domain under study, the life sciences, to allow for an inclusive investigation into different value practices across and between contexts. The empirical domains range from medical science and health-care markets, through zoos, to cod farming. What sets this book apart from many of the dominant theoretical approaches to values (in economics, anthropology, sociology, philosophy, history) is that it takes values as enacted: in actions, in technical practices, and in practices of valuation. Our exercise is rooted in an ambition to consider ‘values’ as things to be explained and explored rather than as given entities with explanatory power.

Quod vide value: price × quantity, irreducible, and mystified

When it comes to values, two inevitable and recurring questions are ‘what are values?’, or ‘how do we define values?’ Many discussions involve a struggle to define, delineate, or even to reconcile different notions of value. What is a value? How do you know when something is a value? How are economic values different from cultural values? How do you know if you are studying values? We believe that these questions are posed in the wrong manner. Here and throughout this volume we explore what would happen if we stopped asking ‘What is a value?’ and started asking ‘How are values made?’ That is, what happens if we shift from an etic register, attempting a priori to delineate and define what proper values are, to posing the emic question: ‘How does something come to count as a value?’

This move has consequences for how we think and write about values. How can we talk about different sets of values without using readily available categories? In this introduction, we deploy a few clumsy and provisional placeholder terms to give an indication of the sets of values that recur across the empirical fields of interest to us. We use words like ‘economic’, ‘medical’, and ‘cultural’ to point to the diverging registers of value that this volume explores. These placeholder terms stem from empirical work, and are not an appeal to analyse values using these words as the only categories. Hence, a few words of caution are necessary: these temporary placeholders are dangerous. They shape the way we approach values. They filter our analysis and they divide the world. It follows that they cannot be an innocent point of departure. They are always already implicated in world-making. What would happen if

we moved beyond these (and other) prefixed notions of values? What would happen if we instead explored the multifaceted, shifting, and entangled making of values?

To underscore the futility of attempting to answer the question ‘What are values?’ we wish to play a short game of *Quod Vide Value*, or looking up value: Many analytical efforts to have been made analyse values, or to use the concept of value for various analytical purposes. A glance at several recent social science reference works provides rich insight into the multiple ways in which the concept of value has figured in various disciplines. First, under the word ‘value’, the *Encyclopedia of Semiotics* affirms that ‘disciplines as varied as economics, philosophy, aesthetics, logic, linguistics, and via linguistics, semiotics all employ a concept of value, though with varying applications and meanings.’ (Bouissac 1998 q.v. value). The *Encyclopedia of Aesthetics* concurs, asserting that ‘value is one of the weightiest, most indispensable, and perhaps most mystified concepts in aesthetics and, beyond that, in formal thought.’ (Kelly 1998 q.v. value).

We learn from *A Dictionary of the Social Sciences* that ‘[c]lassical economics distinguished among “use value” (or how useful an item is to a given person or situation), “exchange value” (which reflects its price on the market), and “labour value” (which reflects the amount of human effort invested in its production)’ as well as that ‘sociologists and anthropologists often have a completely different understanding of value’ (Calhoun 2002 q.v. value). *A Dictionary of Sociology* informs us that ‘distinctions are often drawn between values, which are strong, semi-permanent, underlying, and sometimes inexplicit dispositions; and attitudes, which are shallow, weakly held, and highly variable views and opinions.’ It further states that certain sociological scholars, ‘and Talcott Parsons in particular, overemphasize the importance of shared values in maintaining social order’ (Scott and Marshall 2009 q.v. value).

A Dictionary of Economics is succinct in its entry, giving no hint of scholarly debates about the term. As a first entry it defines ‘Value = price \times quantity’ and as a third entry it defines values as a ‘... general term of praise, used in a phrase such as “good value”. Value in this sense refers to something similar to price but more important and more permanent’ (Black et al. 2012 q.v. value). The latter refers to marketing, and *A Dictionary of Marketing* defines value as ‘the benefit that a good or a service provides, as perceived and measured by the beholder’ and underlines that ‘[w]hat one customer finds of value can be different from what another finds of value’ (Doyle 2011 q.v. value).

On the other hand, in philosophy, *A Dictionary of Critical Theory* defines value as a ‘measure for distinguishing the absolute and relative worth of a thing (an object or a service) both to its owner and to others’ (Buchanan 2010 q.v. value). It further asserts that value ‘is theorized in two main ways, as an ethical problem and as an economic problem.’ *The Oxford Dictionary of*

Philosophy declares that acknowledging ‘some feature of things as a value is to take it into account in decision making.’ (Blackburn 2008 q.v. value) This dictionary further distinguishes between those ‘who see values as “subjective”’ and ‘those who think of values as objective.’ The former, it is posited, think of values ‘in terms of a personal stance, occupied as a kind of choice’, whereas those who hold values as objective, according to the dictionary, ‘suppose that for some reason—requirements of rationality, human nature, God, or other authority—choice can be guided and corrected from some independent standpoint’ (Blackburn 2008 q.v. value).

In our game above, it seems that value is Very Important, but also that it can pertain to use, exchange, labour, semi-permanent dispositions, praise, price \times quantity, a benefit of a good or service, relative or absolute worth of a thing; it can pertain to economics or ethics, sociology, or philosophy; it can be objective or subjective. When does this game of looking up value end?!

Perhaps, in the search for a definition of value we find ourselves in the same unfortunate position as Socrates in trying to find an answer to what virtue is:

How fortunate I am, Meno! When I ask you for one virtue, you present me with a swarm of them, which are in your keeping. Suppose that I carry on the figure of the swarm, and ask of you, What is the nature of the bee? and you answer that there are many kinds of bees, and I reply: But do bees differ as bees, because there are many and different kinds of them; or are they not rather to be distinguished by some other quality, as for example beauty, size, or shape? How would you answer me? (Meno by Plato)¹

Figure 1.1 graphically summarizes the kaleidoscope of definitions of value in the social sciences. The notion of value is evidently at the heart of several different avenues of inquiry and distinctions as well as a source of scholarly disagreements.

What to look for when looking for values?

Do you know what that is asking? You are asking, ‘Could you tell me, without knowing what kind of world we are in, what a... [value] would look like?’

(Lynch 1993: 144 citing Harvey Sacks. Our insertion of value.)

Alas, we do not offer a substantive theory of values: we do not propose an account of what values are, or a definition of them. If this is what you need, other approaches apparently furnish a multitude of answers (a starting point

¹ Thanks to Sergio Sismondo who suggested the similarity between Plato’s discussion of virtues and our discussion of values.

Quod vide Value, or looking up value

Ferdinand de Saussure introduces the concept of linguistic value in his *Course in General Linguistics* (1916), in which it acts as the fulcrum of his general thesis about language.

Encyclopedia of semiotics
(Bouissac 1998)

Classical economics distinguished among use value ..., exchange value ..., and labor value // Sociologists and anthropologists often have a completely different understanding of value. They generally speak of social or cultural values as mechanisms of solidarity and collective identity.

A dictionary of the social sciences
(Calhoun 2002)

Ethics uses value as a means of determining the difference between the various ideas and concepts impacting on everyday life, such as the notions of freedom and life which come into conflict over issues like the right to life of the unborn foetus versus the right to decide of the mother...

A dictionary of critical theory
(Buchanan 2010)

Regarding values as a type of social data, distinctions are often drawn between values, which are strong, semi-permanent, underlying, and sometimes inexplicit dispositions; and attitudes, which are shallow, weakly held, and highly variable views and opinions.

A dictionary of sociology (3rd ed.)
(Scott and Marshall 2009)

1 Value = price × quantity. ...
2 A synonym for price. The theory of value is concerned with explaining the relative prices of goods.
3 A general term of praise, used in a phrase such as 'good value'. ...

A dictionary of economics (4th ed.)
(Black et al. 2012)

[T]he term [value] seems to name an aspect of the world so fundamental to our thinking—so elementary and at the same time so general—as to be both irreducible and irreplaceable.

Encyclopedia of aesthetics (Kelly 1998)

To acknowledge some feature of things as a value is to take it into account in decision making, or in other words to be inclined to advance it as a consideration in influencing choice and guiding oneself and others.

The Oxford dictionary of philosophy (2nd rev. ed.) (Blackburn 2008)

The benefit that a good or a service provides, as perceived and measured by the beholder.

A dictionary of marketing (3rd ed.)
(Doyle 2011)

Excerpts of entries q.v. value

Figure 1.1. Quod vide value, or looking up value

for finding a definition could be *Quod vide value* above). We attempt to offer a different approach to the study of values; an approach that attempts taking the making of values in practice seriously. We are asking the analyst to suspend his/her preconceived notions of what values are and how values are maintained.

We believe that articulations, choices, exchanges, hierarchizations, sortings, displacements, and commensurations of values lend themselves to understanding how values are made. We argue that values should not be seen as intrinsic properties of objects, people, or cultures. Like ethnomethodologists study members' methods, 'ethnomethods', without recourse to structure as explanatory resource we request that the researcher pay attention to members'

construction of values, that is, ‘ethnovalues’ (cf. Lynch 1993: 148). We argue that the making of values happens in practice and that therefore a study of values must pay attention to the bricolage of making them. Our injunction is to attempt an escape from familiar conceptualizations of value in our own cultures—and fashion emically sensitive descriptions of the exotic and mundane practices of valuation (On emics, see M. Harris 1976).

Regretfully then, the only answer we provide to the question of what to look for when looking for values is: look for *the practices of making value* (see following section entitled Values as enacted). Wherever. Whenever. However.

Values as enacted

Instead of helping tie tighter the Gordian knot of a definition of value, we ask what would happen if we pose the question of values differently. What would happen if we take value as something which happens in practices, rather than as a prefixed entity which explains action? What would happen if we saw the genesis, articulation, dispute, and settling of what comes to count as values as matters for empirical investigation and explanation? For instance, the above definitions would function well as entry points—as textual practices—for a study of values in different disciplinary cultures. Thus we would move from an etic register attempting to bolt down what a value is, to an emic register asking how values are made.

We suggest that this more pragmatic, practice-based definition of values allows us to see the world differently. Rather than thinking of values as belonging to different domains—price as economic value, fairness as an ethical principle, efficiency as an organizational ideal—we study them in connection with each other. This breaks down disciplinary barriers and taken-for-granted definitions of what types of values are commensurable, or even possible to study beside one another.

By studying the making of values traditionally seen as belonging to different domains we can see power struggles over which values are to be dominant, the making of boundaries between values (that may become made as separate), and when different values are made commensurable. We can see how coordination is achieved between systems of classification and valuation. How valuations and values shift over time: at one moment value is tied to a biomedical platform, at another it becomes linked to a patent application, at yet another it is connected to the possibility of medical intervention. We can also get a glimpse of how different values are made to occur in opposition to each other, for example, in a commercial ambulance dispatch that must weigh the economic costs against the medical needs. Or when values are tied to organizations and people we can ask: whose values are important?

This leads us to embrace an analytical perspective where values are seen as the outcome of work, where they are the upshot of a wide range of activities. Fairness, to take an example that has frequent currency in the provision of health-care services, is thus seen as a value inseparable from the work of evoking, implementing, and organizing it. This emphasis on practices is very much inspired by the pragmatist stance of John Dewey which has been understood a ‘flank movement’ in approaching values (Dewey 1913; Muniesa 2012). Dewey emphasized the role of valuation as an activity, asking whether values are prefixed or whether they are inseparable from activities of valuation: ‘Do values antecede, or do they depend upon valuation—understanding by valuation a process of reflective estimation or judgment?’ (Dewey 1913: 269). His own orientation was clearly towards emphasizing the process of valuation (Dewey 1939). Our answer to the question is along similar lines: we need to see values as depending upon and being enacted by a wide range of activities, where valuations of various forms are part of such activities.

Our use of the term ‘values’ in the plural relates to the traditional sociological sense of the word, according to which values are seen as conceptions of what is good, proper, and desirable (cf Graeber 2001: 1–2). Anthropologist David Graeber (2001) explains that this use of values in the plural has traditionally been distinct from a notion of value in the singular where it has been used in an economic manner to signify ‘the degree to which objects are desired, particularly, as measured by how much others are willing to give up to get them’ (cf. Graeber 2001: 1). Graeber insists on relating conceptions of what is good, desirable, or important to economic processes and other processes of meaning-making:²

When anthropologists nowadays speak of ‘value’—particularly, when they refer to ‘value’ in the singular when one writing twenty years ago would have spoken of ‘values’ in the plural—they are at the very least implying that the fact that all these things should be called by the same word is no coincidence. That ultimately, these are all refractions of the same thing. But if one reflects on it at all, this is a very challenging notion. (Graeber 2001: 1–2)

Our use of the notion of ‘values’ in the plural joins previous efforts made to break down the distinction between social and cultural *values* and economic value (see, for instance, Appadurai 1986; Aspers and Beckert 2011; Stark 2000; Zelizer 1978, 1981, 1989, 2005). However, we argue that Graeber’s problem is posed in the wrong manner. While he suggests that different manifestations of value ultimately refer to the same thing, we instead argue that we need to attend to how economic value and social/cultural values are *made* separate in

² For Graeber the challenge furthermore entails understanding the limitations of how anthropologists have addressed this challenge and proposing a better way to untie the complex conceptual knitted piece of values.

practice. When the distinction between values (social, cultural) and value (economic) is dissolved, we cannot use one concept to explain the arrangement of the other. Economic value can no longer be seen as a determinant of social and cultural values. Conversely, social and cultural values can no longer be seen as determinants of economic value (as for example in traditional economic sociology and marketing thought; see Baker 1984). What is gained is an opening up of a space to explore recurrent intersections between different values, for instance, between matters pertaining *simultaneously* to the ethical and the economic.

There is thus a strong case for studying the enmeshing of economic and other values. This stance is also reflected in an influential paper where economic sociologist David Stark (2000) advocated reconsidering what he called Parson's pact. From the mid-twentieth-century this pact specified that value was the object of study for economists while values in the plural were for economic sociologists to study. The pact had had its benefits, Stark admitted, but it relied on the limiting distinction between value and values. Inspired by the work of Luc Boltanski and Laurent Thévenot (2006), Stark (2000) advocated for a sociology of worth that did not recognize the strong distinction between economic value and other values, permitting investigation of many relations between various forms of worth. This in turn opens up the topicalization of practices in the life sciences as summoning and producing both economic and other values, and avoids reifying economic practices as different in kind from social or scientific practices.³

The proposition that we examine *all kinds of values* as upshots of practices may appear utterly degrading to any notion of fundamental moral values. Can one really avoid making any strong a priori distinctions between the qualities of values? Are not some values clearly incommensurable with others? Are we, to put it bluntly, selling out ethics and aesthetics by proposing to understand them as potentially no different from say the value of a cupcake?

The answer is 'no'. We are not trying to fit ethics into an economic equation: we instead consider how different values are articulated and sometimes considered commensurate (or incommensurate) in different situations (on commensuration see Espeland and Stevens 1998.) We observe, and indeed want to highlight, that this is what actors, algorithms, and institutions do in many contemporary practices (see a conspicuous example of this in the allocation of donated organs analysed by Philip Roscoe in Chapter 5). Again, this is why the pragmatist stance, and in particular its focus on valuation as a social practice, is so helpful. Such an approach allows us, for instance, to

³ Such reifications are, incidentally, what happens either when the economic is ignored or when it is foregrounded as something preferentially studied in peculiar 'economic' settings such as those of financial markets.

examine competing processes of, and orders of, valuation as a means to examine the articulation (literally) of competing sets of values. It also opens up questions about the technologies, devices, and organization of valuations, which in effect constitute assemblages enacting values. (For more extensive discussions about valuation as a topic of study, see the overviews in Kjellberg et al. 2013; Lamont 2012.)

So our point is *not* to argue that ethics has been economic all along, or that morals can be reduced to social or economic arrangements; instead, we believe that people and institutions deal with ethical and economic concerns in complex ways, and that they try to arrange these values in acceptable combinations or ‘matches’ (Zelizer 2005), among others by assigning meaning and boundaries to situations, actions, and relationships. Whereas what counts as ethical does matter for what counts as economic, and vice-versa, these values are often composed differently in practice, and thus also remain in tension with each other. In this, we wish to caution against the complete analytical naivety proposed by certain pragmatists (cf. Latour 2005) who tend to disregard the historical regularities of society, as well as against the complete and utter reification of values as being decidedly economic/social/cultural.

By narrowing the gap between social and cultural values and economic value we are acknowledging the commonalities between them. They both denote the desirability of certain acts over others; and they both refer to the collective production of that desirability and its governing effect on individual actions. This reminds us that values are not simply a cognitive concept of ordering. Values also have an emotional valence. The desirability of valuable acts and things is not reducible to a hierarchy (of categories of actions, things, etc.) of meaning-making—cognitive knowledge. Rather, value/s refer to orderings that are simultaneously of meaning/knowledge and emotional. Whereas detailed explications of desirability fall beyond the scope of the present book (and would require going into psychoanalytically inspired theories, for instance), we shall stay with the observation that value/s denote and produce the desirable. Desirability must then become plural, as competing orders of desirabilities: different values are made beside each other.

The present book approaches the life sciences with a provisional and agnostic definition of values. We purposefully leave as an empirical question what comes to count as a relevant order of value in given situations, practices, socio-technical systems, institutions, and professional cultures. While this may appear somewhat disorienting to those committed to definitive versions of values, our intention is to use this agnostic position to allow us fruitfully to address a few well-grounded matters of concern.

From matters of concern to stakemaking

Recurringly, scholarly work and media coverage highlight central areas of conflict and tension in relation to values in life sciences: money, fairness, efficiency, and priority are constantly put into play in complex negotiations over value. Accordingly we echo Bruno Latour's call for a renewed critique addressing matters of concern rather than matters of fact (Latour 2004). We believe that inquiries into the workings of values afford us a critique that *adds* to the concerns it addresses—for instance commodification processes in the life sciences—rather than merely debunking them. Latour writes 'Give me one matter of concern and I will show you the whole earth and heavens that have to be gathered to hold it firmly in place' (Latour 2004: 246).

Maria Puig de la Bellacasa's work with matters of care—the emotive dimension of matters of concern—is also of particular significance in this regard. In her work she grapples with questions of commitment and attachment (de laBellacasa 2011). For de la Bellacasa this means that we need 'to engage properly with the becoming of a thing, we need to count all the concerns attached to it, all those who care for it' (de laBellacasa 2011: 90). But rather than just counting concerns or attending to those who care, we wish also to call for attention to the making of concerns; the production—in practice—of what comes to count as valuable, desirable, or otherwise worth caring for. To emphasize a shift in attending to the ready-made, a connotation which is present in both matters of concern or care, we wish to call attention to the making of such matter—the making of stakes, or as we choose to call it, stakemaking.

We argue that value practices are crucial practices by which people and things make stakes, matters of concern, or matters of care—or displace them. Sometimes, values and their practices are salient matters of concern themselves—salient things that have to be brought and kept in place through complex compositional processes. Below we introduce the three main areas of concern for the present book, and our endeavour.

HOW ARE MATTERS OF CONCERNS MADE? VALUATION PRACTICES AND STAKEMAKING

Restrictions covering sheep movements after the Chernobyl nuclear disaster have finally been lifted from all farms in England and Wales after 26 years. After the 1986 disaster, the Food Standards Agency (FSA) placed controls on 9,800 UK farms, but these were gradually removed. The final eight in Cumbria and the last 327 in Wales are now free of them. Adam Briggs, from the National Farmers Union, said it meant an end to the 'sorry situation' of the Chernobyl legacy.

(Anonymous 2012)

In the wake of the Chernobyl accident, in April 1986, the sale of sheep from Cumbrian hill-sheep farmers was severely restricted due to the presence of high levels of cesium. For some farmers there was great uncertainty as to whether the nuclear fallout affecting the Cumbrian sheep resulted from the proximity to the Sellafield nuclear plant. However, the British government's culture of reassuring the public and projecting certainty and control permeated government communication. The stakes were high: government officials wanted to handle risks of nuclear fallout and reassure the public, while hill-sheep farmers' livelihoods were put at risk (cf. Wynne 1989). This situation of unsettled stakes—unsettled matters of concern—repeated itself almost uncannily after the Japanese Fukushima disaster on 11 March 2011. The uncertainty about radiation damage produced widely diverging interpretations of what were supposed to be the matters of concern:

The divergence of opinion has led to divisions among families, generations and communities. 'Should I stay or should I go?' is a question that weighs heavy on countless minds. It is why hotels in north-eastern Japan are struggling to attract tourists. It explains the rash of postponed visits by foreign dignitaries to Tokyo. And it is a particular worry for those whose DNA is most vulnerable to change: expectant mothers and young children. (Watts 2011)

The Chernobyl and Fukushima catastrophes can both be interpreted as struggles over matters of concern or care. What is at stake is not a settled matter. People struggle to make sense of knowledge, companies struggle to survive, the government struggles to provide guidance and aid to those who need it. In both cases, the economic and epistemic work of central government is pitted against local work, knowledge, and experience. The concerns vary widely. Valuations of life, knowledge, and money become matters of concern. Whose assessments of radioactive fallout are valid? Whose valuation of lives, quality of life, and livestock? Assessments of different values are intertwined: economic value, risk values, health values, quality of life.

In addition, in the making of concerns, the emergent expectations around science and technology have been shown to be of crucial importance (Adams et al. 2009; Borup et al. 2006; N. Brown and Michael 2003; Fukushima 2012; Simakova and Coenen 2013; Tutton 2011). The promissory rhetorics of science and technology perform certain worths, are involved in making matters of concern or care. The promises of lower radiation levels, of health, safety, and a good life are all part and parcel of performing certain values around which matters of concern revolve.

In this volume we pose a number of questions related to *stakemaking*—the production of stakes, concern-making, and care-making. These questions move orthogonally to knowledge practices, but are not separate from them. They are about the production of concerns through the production of values:

- How are matters of concern performed through economic valuation practices (e.g. Clarke et al. 2003)?
- How are matters of concern performed with technical, classificatory, and institutional systems (Bowker and Star 1999; Star 1991)?
- How are matters of concern performed through the use of scientific theories, reflecting world views that include what/who is worth living and/or taking into consideration (Fujimura 2013)?
- Whose voices, worldviews, needs, and interests come to shape matters of concern (Callon and Rabeharisoa 2003, 2008; Galis 2006; Galis and Lee 2014)?
- How are performances of the values of objectivity, impartiality, non-bias, and calculation mobilized to make matters of concern (Haraway 1988)?
- How are subjectivities and affect co-produced with matters of concern (de laBellacasa 2011; Skeggs and Loveday 2012)?

Our theoretical interest in the production of matters of concern stems from an interest in the relation between valuation practices and questions of power, social order, and the production of subjectivity and affect. However, as we have already hinted, we do not want to treat values as an external force that explains power, order, or subjectivity. We instead call for a sensitive exploration of how valuation practices are intertwined with stakemaking in the life sciences—and more broadly, in science, society, and technology. How are valuations part of making stakes? How are matters of concern held in place? Valuation practices which implicate knowledge, expertise, and economy have far-reaching effects for who is in a position to produce stakes, to know, to influence, to gain—and who is not.

WHAT IS WORTH KNOWING? VALUES AND THE EPISTEMIC

What happens if I get placebo and TroVax[®] is then shown to work? Although the five-year survival rate for metastatic renal cancer is less than 5 percent, the answer [in the patient pamphlet] to the question is given as: ‘If the study shows TroVax[®] prolongs survival and you received the placebo [in the trial], you will be given the opportunity to be treated with TroVax[®], following regulatory approval.’

(Jain 2010: 89)

A randomized controlled trial (RCT) testing a new cancer drug might be valued as an invitation to both patients and oncologists to ‘live in a space organized through both hope and progress’ (Jain 2010: 90). Patient and oncologist hopes for at least a prolongation of days of living are entangled with the large-scale production of data for purposes of producing scientific knowledge of the efficacy of a new drug. The clinical trial entails the enactment

of many values; in the recruitment, patients and their oncologists enact values of 'hope and progress', while the overall trial enacts values relating to the prospect of acquiring new scientific evidence of the efficacy of the drug.

In short, as Lochlann Jain (2010: 90) clearly demonstrates, the trial exists in a nexus of valuations that enact different and even divergent values. Most poignantly in this case, the patient pamphlet understates the temporal scope of the trial as well as the need for a certain number of trial subjects to die for the trial to provide viable knowledge. Setting these particular misrepresentations aside, the example vividly illustrates how many different and divergent values may be in play in relation to knowledge and knowledge production in the life sciences. Values of life and living are intertwined with the values of a particular scientific result and indeed with a particular mode of knowing, such as the calculability of life (and death).

It is therefore urgent to address questions such as:

- Who and what comes to decide what is worth knowing, and what it is worth (cf. Helgesson and Lee 2012)?
- What values are articulated and given weight when deciding what is worth knowing?
- With what means do data, methods, and objectives acquire value?
- How are valuations pertaining to the economic intertwined with the articulation of values in choosing subjects, objects, and methods for pursuing knowledge?

Knowledge and its means of production are linked to values and valuations in numerous ways. The presentation of scientific awards such as the illustrious Nobel prize, or the more mundane granting of grants (cf. Lamont 2009), are but two expressions of the array of valuations performed as part of science. Valuations are also deeply ingrained in the very practices of scientific work (see the contributions by Dussauge, Helgesson and Johansson Krafve, Lee, and Widmalm, in this volume).

There is thus a strong case for taking an interest in the links between values and the epistemic. To the extent that the classic sociology of scientific knowledge (SSK, see, e.g. Bloor 1976) was interested in these links, it was primarily to investigate how the values of certain social groups became imprinted in knowledge claims: values (and interests) were treated as explaining the stabilization of scientific knowledge. Our question is rather how values are made in, and in relation to, science.

Our theoretical interest is directed towards the enactment and stabilization of values in relation to the epistemic. Briefly stated, values are central to what urgently needs to be explained. This means that our primary focus is not so much on how values might guide the scientific gaze, but instead on how values are formed and articulated in, for instance, processes of valuation related to

the epistemic. Even more urgently, we need to investigate the practices for dealing with shifting and conflicting values.

HOW MUCH IS IT WORTH? VALUES AND THE ECONOMIC

On Saturday 2nd December Pfizer decided to end clinical trials of torcetrapib, a drug that promotes the creation of the good variety of cholesterol, known as HDL. Initial results had shown that the drug was associated with an unacceptably high rate of death among users. Only two days earlier Pfizer's research chief, John LaMattina, had described the drug as 'the most important new development in cardiovascular medicine in years.' On Monday investors, who had hoped that torcetrapib would be a commercial blockbuster, knocked more than \$25 billion off Pfizer's stockmarket capitalisation, reducing the firm's value by one-eighth.

(The Economist 2006)

The fate of the Illuminate trial indicates how financial values can be entwined in many ways in medical research. The decision to end the trial followed the release of information from a monitoring body that eighty-two trial subjects receiving torcetrapib had died versus only fifty-one subjects in the control group (Berenson 2006). The premature ending of the trial meant the loss of almost \$1 billion invested in the drug and reduced the company's market capitalization even more. This is a striking and large-scale example of the links between medical research and financial markets. At one point, the trial involving some 15,000 subjects represented an investment based on promises of future revenues derived from knowledge about how torcetrapib might improve treatments for preventing heart disease. Following the news about the disturbing extent of deaths among trial subjects, the trial meant financial losses as well as a realization that the sought-after knowledge would not materialize. Not only does the very existence of the trial certify that something had been considered worth knowing, but the valuations pertaining to both its realization and premature closing clearly engaged and enacted a variety of both economic and non-economic values.

The life sciences do not only entail important intermingling between the economic and non-economic values, as illustrated by the Illuminate case. The emergence of biobanks provides an important illustration of how endeavours in medicine and the life sciences mix with various economic domains, such as commercially driven research and the public sector. For instance Catherine Waldby and Robert Mitchell (2006: 80) describe the configuration of the UK Stem Cell Bank, in which depositors agree that cell lines must not be sold for financial gain and where public sector researchers will pay marginal costs for cell lines while commercial users pay full costs. This ensures that 'the knowledge and therapies generated will be available to fellow citizens' (Waldby and

Mitchell 2006: 80). This particular initiative aims, through the use of specially designed rules and agreements, to create an economy for the exchange of cell lines which operates quite differently from a more commercially driven tissue economy. While being an economy including economic values—marginal costs, full costs, etc.—it clearly aims to enact a different set-up of values than would another form of tissue economy.

In attempting to analyse the making of economic values alongside other values it is thus urgent to address questions such as:

- How are knowledge and life transformed when they become described and treated as primarily subject to economic goals and constraints?
- How and with what means are economic values made in practice?
- How are boundaries and links made between notions of economic, epistemic, and cultural values?
- How are different values (economic, cultural/social) performed as distinct, intertwined, homogenous, or heterogeneous (Brown 2013)?

Financial losses and gains are intimately linked to what is known and unknown, to what trials do and do not demonstrate. However, as we can begin to anticipate from the above examples, economic values, in the plural, can go beyond plain profit, market capitalization, and differentiated pricing: for instance, values might involve maximized public health, or the efficiency of systems and interventions, and so on. In the above examples, economic value is complexly entangled with non-economic values: commercial decisions about new drugs are made alongside evaluations of the risks of patients dying from side effects. People wanting to contribute their bodies to the possible generation of therapies that aim to help fellow citizens might also generate profit for manufacturers.

What makes these values economic is that actors articulate them as such: through explicit categorizations; through the attribution of expertise on an issue to economic experts, etc. It is in this sense that we use the concept of economic values in the following. A crucial question is therefore how science, knowledge, and health-care practices are routinely assigned economic value, not only when pricing a drug or assessing the marginal or full costs of supplying a cell line. The making of economic values is deeply ingrained in the practices of research and health-care provision and moreover enacted with/against other values. Our main concern here is how economic value is continuously constituted as a steering mechanism (and object of critique) in biomedicine and health services (see, for instance, Johansson Krafve 2012; Moreira 2012; Sjögren and Helgesson 2007), and how the assembling of economic value tends to dominate the assembling of other non-economic values (cf. Chapter 6 by Zuiderent-Jerak et al. in this volume).

We wish to articulate a perspective which takes very seriously the composition of values and the making of boundaries between them—be they fashioned as economic, cultural, or epistemic. But we also wish to emphasize that it would be dangerous not to pay attention to the repertoires in which different values are articulated. One danger in particular would be to a priori reduce them to effects of one another—or to give analytical precedence to one set of values. Just as we cannot simply replace one set of values with another, Latour (2004) has warned against the danger of simply replacing certain matters of fact with other facts. The question is how to take seriously the politics of the boundaries between different values that are created in practice.⁴ Attending to matters of concern implies attending to the complex, concrete, local, and global relations between value and values.

Two precursors of the study of values in the life sciences

As outlined above, this volume proposes a vantage point from which to observe how different values in the life sciences are enacted in actions, technical practices, and valuation practices. Looking at how such ‘value practices’ enact values provides a route to investigate the entwinement of, and conflict between, diverse values, be they economic, moral, legal, etc. This overall theoretical starting point represents a pragmatic understanding of values which distinguishes it from the main strands of research in the area, centring around the notions of ‘biocapital’ and ‘moral economy’.

BIOCAPITAL: THE ENMESHING OF BIOLOGY AND ECONOMY

The enmeshing of capitalism and biotechnology has been a growing concern for science studies, ever since Edward Yoxen (1981) brought attention to the increasing operation of capital at the molecular level of the biotic: ‘[A] specific mode of the appropriation of living nature—literally capitalizing life’ (Yoxen 1981: 112). The move to analyse these processes has enjoyed many labels

⁴ In its traditional manifestations, science and technology studies (STS) has made few contributions concerning economic orderings and valuations. The emergence of STS-influenced studies of markets (Callon 1998; Callon 2007), most notably financial markets (MacKenzie 2006); MacKenzie and Millo (2003), can be seen as a move to take the economic seriously. However, this shift of attention to markets and in particular to finance actually underlines the traditional inattention in STS to economic practices in the domains of science and technology. Alas, it is only in the ‘biocapitalism’ literature that we find the most contributions to theorizing the relationship between economic and other values in biomedicine (see Part III on biocapital).

ranging from biovalue, genetic/-omic capital, to bioeconomy and biocapital. The common issue is the attention to the labour and commodification processes which distinguish the production and promotion of biotechnological products (Helmreich 2008).

The analysis of biocapital brings together a disparate cluster of perspectives ranging from Marxist and Weberian to post-Foucauldian analyses, whose common denominator is awareness of a change in the relationship between the business world and the modes of organizing the life sciences. Two works, Kaushik Sunder Rajan's *Biocapital* (2006) and Nikolas Rose's *The Politics of Life Itself* (2007), have emerged as key texts to come to grips with these developments.

Sunder Rajan (2006) compares the US and Indian biotechnology industries in seeking to understand the capitalist practices and subjectivities that emerge in the porous relationship between the academic and the corporate world. He hones in on the promissory rhetorics of biotechnology, the colonialist moulded flows of inequality, and genomics as information science. Rose's (2007) approach is different, but with similar theoretical predecessors. Rose's main interest is to explore the emerging 'somatic ethics' of biocapital and the processes of subjectification in relation to life-science technology. The 'biocapitalism' literature thus proposes one way to theorize the relationship between life sciences, power, and social orderings in late capitalist culture.

However, with Helmreich (2008) we might ask how we could look beyond capitalism as the stable signifier towards other complex arrangements of values. How do we move beyond re-inscribing capitalism as the stable entity around which all other values are ordered? What would happen if we with Kristin Asdal (2011) start asking questions on processes of biocapitalization instead? Another issue which sets our approach apart from that of the biocapitalism literature is our point of expanding the Marxist flavoured analysis of value as accruing from labour (see, for example, Mitchell and Waldby 2010) by paying attention to the enactment of value in different actions and practices. By broadening the issues that the biocapitalism literature outlines, we emphasize values, not as a static category revolving around capital and labour, but as a heterogeneous phenomenon that must be understood in its many guises.

VALUES IN THE MAKING OF SCIENCE: THE MORAL ECONOMY PERSPECTIVE

The notion of moral economy, originally introduced by E. P. Thompson (1971), was reintroduced in the 1990s into the history of science as a way to capture the various norms and values that regulate scientific activities and structure communities. As used in recent work on scientific practices, *moral economy* refers to a system of exchange based on certain principles of fairness

and means of control regarding access to the resources scientists need. The moral economy concept, resurgent in an increasing number of publications (Atkinson-Grosjean and Fairley 2009; Daston 1995; Kohler 1994; Lock 2001; McCray 2000; Strasser 2011), encompasses notions of moral values and notions of how a scientific community should conduct various kinds of exchange, including what rewards are appropriate for productive work:

Moral conventions regulate access to tools of the trade and the distribution of credit and rewards for achievement. As the moral economy of eighteenth-century English laborers was rooted in concrete, historical systems of agricultural production and marketing, so are the moral economies of experimental scientists rooted in specific configurations of materials, literary, and social technology. (Kohler 1994: 12)

The notion of moral economies in science is an interesting attempt to capture and characterize a given scientific domain in terms of a particular set of values. Lorraine Daston (1995) proposes a somewhat different conceptualization with a much wider focus on how cultural values shape the epistemic aspects of scientific practice: ‘Moral economies . . . are integral to science: to its sources of inspirations, its choice of subject matter and procedures, its sifting of evidence, and its standards of explanation’ (Daston 1995: 6).

This conceptualization opens up for examination the intertwining of values in scientific practice in which economic, epistemic, and methodological values are in practice seen as facets rather than distinct categories (cf. also Atkinson-Grosjean and Fairley 2009; Rasmussen 2004). Daston takes pain to emphasize how the notion differs from that of the Mertonian norms, stressing precisely the historically contingent nature of moral economies: ‘In contrast to Mertonian norms, moral economies are historically created, modified, and destroyed: enforced by culture rather than nature and therefore both mutable and violable; and integral to scientific ways of knowing’ (Daston 1995: 6).

Yet, despite this emphasis on contingency, the notion of moral economy seems often to be used to focus attention on how values *regulate* action. In other words, it is put to greater use in characterizing what appears to *guide* valuations and other behaviours in a given scientific field, rather than focusing on how such composites of values are shaped and sustained. What we have here is a notion that is frequently used to highlight the regulation of expectations and behaviour, and the historical contingency of such guiding regulations (values), but does not tell us how these very values are produced in the first place. The traditional use of moral economy thus carries with it the risk of becoming not only a concept for depicting the (actual) set of values manifest in a domain of scientific practice, but also for backgrounding the very making of such values.

The rudiments of a 'value practices' approach: The four themes of this volume

The two approaches discussed in the two preceding sections, The Moral Economy Perspective and The Biocapital Perspective, provide an influential contribution to the analysis and problematization of values in life science. However, we have argued that there is a pressing need to move beyond these conceptualizations of value in life science, in favour of a perspective which analyses the diversity of value practices in the life sciences.

First, we argue that there is a need for more pluralistic analyses of value. Rather than fixing economic notions of 'capital' (Franklin and Lock 2003; N. Rose 2007; Sunder Rajan 2006, 2012) or more recently 'assets' (Birch and Tyfield 2012) as the stable reference points for analysing value we wish to reorder the analysis to allow for analyses based on understanding values in the plural (Helmreich 2008). Thus, we wish to nurture empirically sensitive accounts about which values come to count as important at any given time or place. The question of which values determine (or corrupt) action are replaced with questions as to how values are made in practice. We thus wish to shift our analytical awareness towards a sensitivity to processes and away from a sensitivity to how values guide behaviour in different settings. Rather than taking an interest in which values are predominant in a given period or place (Daston 1995), we would urge for investigating the processes and practices that constitute borders, commensurations, or orders of values. We argue that values should be seen as always already constituted in practices, not as static entities which exist outside of action.

In terms of a pragmatist take on values, a suggestion from a number of authors in this volume would be to ask a novel set of questions that stresses the performative aspects of moral economization or biocapitalization. Here questions of how capital (or assets) shapes biomedical practice or objects are replaced by an interest in how emic notions of economy are made beside other notions of value in biomedical practice. Questions on the topography of specific moral economies are replaced by questions on how such topographies are constituted. How are values (in the plural) made? Thus, rather than leaving behind the important work done by scholars on biocapital or moral economy we wish to make an orthogonal move which takes as point of departure the making of biocapital or moral economies. With Kristin Asdal or Carrie Friese (both in this volume) we wish to inquire into biocapitalization (Asdal, Chapter 9) or moral economization (Friese, Chapter 8).

Second, the present volume aims to develop an approach that engages with the question of making multiplicities of values. In summary, the pragmatist approach we have begun to outline above investigates how values are made, rather than taking values as stable predefined entities. Values should be seen as

the outcome of work (they are made, assembled, enacted in practice). This necessitates an analytical interest in what comes to count as value, and the processes that lead to this fleeting state of affairs. A corollary of this is that values cannot be seen as an explanatory factor, but rather something that needs to be explored and explained.

Through these pragmatist moves we wish to foster understanding of the composition of multiplicities of values: the establishing of relationships, the drawing of boundaries, commensurations and incommensurations, the ordering of hierarchies, and the production of desirabilities. In an effort to outline a 'value practices' approach to the concerns raised above, we aim to focus on how values are enacted: in actions, in technical practices, and in practices of valuation. In this we will try to account for both how peoples' actions draw on values, and how agents' actions and reactions come to enact values.

Third, our pragmatist approach to values crucially allows us to address three concerns in the fields we address.

Our first concern relates to stakemaking: the production of matters of concern or care. We wish to inquire into how the assembling of values is part of producing stakes. In the production of values, people, practices, and devices produce a transient fixation of what counts as important, valuable, or desirable. We argue that it is crucial to understand how matters of concern are continuously accomplished and held in place through the production of values.

Our second concern deals with how the making of values is intertwined with the making of facts. Here we do not ask how values guide the scientific gaze, but instead how values are made in relation to the epistemic. How is 'valuable knowledge' established? How do controversies about 'values' implicate controversies on facts? How do values and facts mesh or diverge?

Our third concern pertains to how economic values are made alongside other values. Here we wish to counteract the tendency to give precedence to a certain repertoire of value. The pragmatist approach we propose makes the question of determining values an empirical question. To ask whether social or economic values should be the basis for analysis is to miss the pragmatist mark. Attention to the making of stakes necessitates attention to the articulation and disarticulation of different types of values, be they economic, social, or something else altogether.

INTRODUCING THE FOUR THEMES OF THE VOLUME

This book gathers together fourteen distinct chapters on the various aspects of the life sciences and medicine. These chapters encompass contemporary as well as historical contexts and probe, in different settings, what comes to count as valuable, desirable, or condoned. The chapters of this book have different

entry points and take different approaches. They develop theoretical insights useful for further studies, and may well not be fully coherent with one another. In other words, the contents of this book have not been, and are not, bound to follow the routes we outline above. This is why we will not at this point further articulate our proposal for a ‘value practices’ approach: We do that in the concluding essay, the last chapter of this volume.

CONFLICTED ‘PUBLIC’ VALUES

The first part of the book deals with the production of boundaries of acceptable behaviour in the life sciences. It comprises three chapters that ask: How is proper economic, medical, and scientific behaviour made in practice? How are economic goals and personal ambitions made compatible (or not) with the life-saving purposes and ethical practices of health care and medicine? How is the production of medical knowledge affected by economic interests and ‘publication planning’ by big pharma companies for profit maximization made acceptable? The chapters in this part examine the boundary work, the negotiations, and moral quandaries of delimiting and defining proper conduct in the biosciences, medicine, and the pharmaceutical industry. The chapters chart an uneasy terrain of value—where scientists and their actions are constantly evaluated by different yardsticks—monetary, moral, objective. These yardsticks become crucial in ordering and creating hierarchies. Understanding the measure of ‘good science’ involves including significantly different metrics, enacted in widely varying practices.

The first chapter of this part, by Sergio Sismondo (Chapter 2), explores how key opinion leaders (KOLs) in medicine delimit what is considered acceptable medical, scientific, and economic behaviour. At stake is the handling of economic and scientific ‘conflicts of interests’ in the marketing and publication of pharmaceutical products. Sismondo demonstrates how the KOLs construct boundaries between science/medicine and pharmaceutical marketing practices by referring to the objectivizing practices of the US Food and Drug Administration (FDA) and the randomized clinical trial. Here Sismondo uses the example of the KOLs to explore the conflicts of value between the pharmaceutical industry and medical research. He asks how KOLs work to reconcile their medical/research role with their close collaboration with the pharmaceutical industry. The chapter shows how KOLs use a belief in the mechanical objectivity of medical science to justify their actions. A belief in mechanical objectivity counteracts a fear of biased research, as objectivity is achieved through an impersonal FDA-machine, even making interested research a goal to strive for. In the words of one KOL quoted in the chapter: ‘No conflict, no interest.’

Chapter 3, by Christer Nordlund, also examines the reciprocal exchanges between the pharmaceutical industry and scientists. However, Nordlund focuses on exploring the shared interest in collaboration at different levels: the material exchanges of resources such as laboratory equipment or urine, the exchange of laboratory services, as well as the exchange of reputation. Nordlund argues that the long-term exchange relationship between pharma and science must be constantly hidden from the public eye. The free exchange of resources between the two spheres is deemed highly problematic in terms of a medical code of conduct. Thus, rather than focusing on the justificatory repertoires of scientists, the chapter explores the mutual benefit that the exchanges between the pharmaceutical industry and science bestow on each party. The chapter shows how mutual interests in developing hormones directed the actions of both the pharmaceutical industry and researchers. However, the chapter also demonstrates how the quite different moral economies of science and of the pharmaceutical industry caused the public to perceive of the collaboration as less than ideal, making it necessary to downplay collaboration and stress the independence of scientists from industry.

Chapter 4, by Sven Widmalm, analyses the practices of rule enforcement in matters of priority, publication, and plagiarism. Here, analysis of a conflict over publication priority and its adjudication by a 'court of peers' provides insight into how scientific rules were negotiated and interpreted in the international biochemical elite. This process focused on the specific virtue, character, and conduct of scientists rather than on higher order social norms. Enacting the importance of the fact/value distinction, the process of judgement attempted to separate the establishment of factual statements from the evaluation of the same statements. However, the process of establishing factual publication priority was intimately intertwined with the evaluation of the character of scientists, and ultimately with upholding the legitimacy of the scientific system.

These chapters explore how actors struggle to define and construct ethical behaviour in practice. What are acceptable courses of action in science and medicine? What is a virtuous clinician? What is an upstanding scientist? How does s/he behave? Values do not precede behaviour but rather are constituted in practice.

MARKETS AS CARERS FOR HEALTH

The second part of the book examines the fostering of health services and medical science through market arrangements and the parallel making of the values of justice, utility, and efficiency. The three chapters in this part treat issues that are crucial in light of the contemporary trend in which markets are seen as means to create public value. How is competition made in practice?

How can the scarce supply of transplant organs be distributed fairly? How is quality counterpoised against to the cost of care in health-care provision? By what means and to what effects are market arrangements deployed when organizing the provision of health services? How are economic valuations performed as part of or alongside other valuations? How are economic values intertwined with epistemic and cultural values?

The studies in the second part examine the precarious work of fostering markets catering to the many problems and values of health care—be it in terms of generating competition among potential developers of a malaria vaccine (Chapter 7 by Neyland and Simakova); securing a good supply of transplant organs (Chapter 5 by Roscoe); or providing health-care services more broadly (Chapter 6 by Zuiderent-Jerak et al.). These studies contribute to the growing and diverse literature on the markets and economization in health care (e.g. Greener 2003; Johansson Krafve 2012; Jost 2007; Kurunmäki 1999; Kurunmäki and Miller 2008; Le Grand 2007; Mol 2008; Moreira 2012; Porter and Teisberg 2006; Porter 2000; Sjögren and Helgesson 2007).

A recurring subtext in conversations about markets in the provision of health care is that a number of diverging values are at stake in this area. Each of these three contributions critically and closely examines the efforts to organize health services and medical science with markets. Yet, instead of remaining focused on abstract principles of markets and health care, the merit of these contributions is their impertinence in looking more closely at the challenges faced, the efforts made, and their multiple and uncertain consequences. While stopping short of concluding that health-care markets do not work in principle, these contributions emphasize the uncertainty of their outcomes in practice.

The first chapter of this part, Chapter 5, by Philip Roscoe, deals with the precarious construction of organ allocation algorithms, which entails integrating different values, such as justice and fairness, utility, and exchange value, into prosaic algorithms. ‘Who should get an organ?’ is the crucial issue at stake. Here, Roscoe examines how, in the case of protocols for allocating transplant organs, surgeons integrate moral valuations with prosaic notions of utility and exchange value. Research into the plurality of value regimes has shifted attention from a subjective, marginal utility approach, in which commodities have value only in as much they are valued by buyers; the chapter argues that non-financial arrangements for exchange may still maintain some of the characteristics of a marginalist economy, in which exchange value is a product of scientific coding. It invokes the concept of a moral economy to frame the negotiations between exchange value, and considerations of right and wrong, of inherent worth, scientific knowledge, and the rights and responsibilities of patients and practitioners.

The next chapter (Chapter 6), by Teun Zuiderent-Jerak, Kor Grit, and Tom van der Grinten, examines the valuation practices by which multiple values

(such as quality and cost) are integrated into market practices of the Dutch healthcare system. The chapter demonstrates how, despite the availability of a multiplicity of 'valuemeters', quality of care is still framed in cost-saving terms. The authors thus provide an alternative to the usual polarizing discussion about the merits of markets in biomedical domains. By examining valuation practices Zuiderent-Jerak et al. investigate how experimental valuemeters might bring multiple worths into market practices. Empirically the chapter scrutinizes the relationship between markets and public values in Dutch hospital care. The authors demonstrate that although the policy aim of the financial instrument analysis was to create care products that would stimulate competition over quality, and ensure affordability and accessibility of care, this market device profoundly influenced how public values such as quality were defined in practice, i.e., quality was shaped in cost-saving terms. This happened not in the absence of, but despite the wide availability of precisely the valuemeters (Latour and Lépinay 2009) that according to both health economists and social studies of markets scholars claimed would enable the articulation of non-financially defined quality. The authors conclude that a narrow focus on either 'devizing valuemeters' (as proposed by authors from social studies of markets) or 'reducing information asymmetry' (a key strategy in health economics) is insufficiently politically sensitive. To account for a wider range of public values in health-care markets, value practices need to focus on the political process of articulating and disarticulating certain values.

Daniel Neyland and Elena Simakova have written the final chapter (Chapter 7) of this part. It focuses on attempts to introduce a market for malaria vaccine, and how this market is framed as an ontologically singular means to incentivize vaccine research. However, the markets' ontological singularity slips away, becoming messy, unsettled, and uncertain amid market experimentation. Despite this disjunction between the ontological singularity of the market and the multiplicity of market experimentation, the market is still claimed to be the best means to produce malaria vaccines. Here, Neyland and Simakova focus on how those involved in attempts to produce a malaria market continually work to manage slippages between apparent ontological singularity in market framing (that the nature of things are settled and well known) and multiplicity in market experimentation (in which the nature of things appears to become messy, unsettled, subject to new questions and assessment). In research, these slippages are noted by economists, scientists, and policymakers. However, despite any counter-expectation that such slippages should lead to criticism or even abandonment of the market as a focus for managing malaria, the market (broadly construed) continues to be heralded as the solution to the problem of malaria. The chapter critically examines how health-care concerns around malaria are made amenable to a 'world of worth' (Boltanski and Thévenot 2006) manifested in the market.

Here we explore the how the topic of markets as carers for health involves the enactment of several multiplicities of values. How is the market made to relate to other values, such as public health, justice, fairness, quality, or public image? The production of values around efforts to make markets produces stakes: what is and is not important?

VALUING HUMAN AND NON-HUMAN BODIES

The third part of the book examines how the worth of various lives and life forms are crafted focusing on the management of human and non-human populations through health technologies and biotechnology. The part grapples with questions such as: What lives come to count as being worthy of existence? What life do we—experts and laypeople—endow with the value of living? The chapters of this part address widely different practices through which life-worthiness is made. This part highlights transformation, as nineteenth- and twentieth-century institutions for managing human and non-human populations for modern purposes adapt to the twenty-first.

The first chapter in this part (Chapter 8), by Carrie Friese, examines ‘genetic value’ in the contemporary breeding practices of zoos struggling to maintain their place in a new century. Practices of animal breeding for conservation purposes in zoos lead Friese to ask: What populations do zoo scientists and other experts regard as valuable, or as surplus, and within what moral and economic orders do these values emerge? In this chapter, Friese explores the logic of genetic value and its socio-historical context. The chapter addresses how zoos exploit the life sciences in pursuing changing economies in wild animal bodies. The focus here is on the production of ‘genetically valuable’ individuals in what appears, on one hand, to be a techno-scientific economy comprising laboratory skills and research materials. On the other hand, genetic value also expresses the ways in which the zoo asserts itself as a moral institution, one that remediates its past errors which contributed to the endangerment of many wild species. Through this moral economy, zoos intend to create, exchange, and preserve endangered animal cells and bodies in order to contribute to species preservation. Friese considers the iterative relationship between these two different kinds of zoo economies in asking how moral economies and techno-scientific economies are co-constituted.

In the second chapter of this part (Chapter 9), Kristin Asdal interrogates the Norwegian efforts to create a new food product, the farmed fresh cod. Asdal suggests that the biocapitalization of the cod requires a ‘co-modification’ of the living entity and the market for it. Asdal asks how life and markets are co-modified to harvest value from the sea, and what kinds of values are enacted in this process. Asdal engages with cod farming and explains how the life underwater is cultivated to produce future values. The powerful locus from

which such (potential) future values spring is not only the life sciences ‘in the field’, but also series of policy documents and strategy plans (including research and innovation policy documents) that value and evaluate such efforts. Asdal argues that these documents are devices for producing certain regimes of worth (Boltanski and Thévenot 2006) and for the timing and taming of future values. Asdal argues that these political devices are devices for ‘co-modifying’ markets and biological entities, and that they also operate on the values of the science and scientists involved.

The last chapter in this part (Chapter 10), by Ilana Löwy, analyses the historical implementation of and regulations for human prenatal screening in the late twentieth century. More specifically, Löwy investigates the conflicting values driving the framing of Down’s syndrome as an epidemic in the history of prenatal diagnostic technologies. Löwy asks: On the basis of what moral, scientific, and health expert values was prenatal screening driven by professional and non-professional actors? Thus Löwy also raises the political question of how the values of the less-in-power (e.g. laypeople anxious to give birth to healthy children) can be exploited to induce people to accept measures driven by an entirely different set of values (i.e., a public health framing of Down’s syndrome as an epidemic to be eradicated). Löwy examines the consequences of the generalization of prenatal diagnosis (PND) and its incorporation into routine pregnancy monitoring. In industrialized countries, the expansion of the PND was closely related to the wish to ‘prevent’ a specific condition, Down’s syndrome. In countries where abortion is legal, PND and associated testing technologies gave rise to expectations that the sum of individual decisions would reduce the burden of handicap in populations, transforming the ‘risk of disability’ into a privately managed public health problem. In countries where abortion is illegal, management of the ‘risk of disability’ remains in the private—and privatized—sphere. This chapter addresses the intersection of public values, health policies, technologies of biomedicine, ethics, and private practices.

This part illustrates that biotechnologies of human and non-human animal bodies, as well as health policy and expertise, partake in systems of value attribution that define, order, and rank which bodies are worth their lives—and what those lives are worth to others.

VALUATIONS AND KNOWLEDGE

The last part of the volume deals with values in laboratory work. Its three chapters consider several questions: How do actors construct boundaries between interested and non-interested science? How are links between interests and the valuation of scientific work linked in practice? How are data valued? How are incommensurable values performed in large and distributed scientific endeavours? How do scientific models perform specific valuations of

human behaviour? How are economic issues performed alongside or separate from other values in science? By beginning to answer these questions these chapters probe the intertwining of the economic and the epistemic in the life sciences. The chapters explore the making of several topographies of values, in which the life sciences handle constant clashes and coordinations between different performances of values.

In Chapter 11, on 'Purity and interest', Francis Lee demonstrates that the dichotomy between pure and interested science is simultaneously upheld and broken down in practice, the point being to demonstrate how viewing interests as an empirical category—not an explanatory concept—can shift our attention to the links between performed interests and divergent values, valuations, and evaluations in the life sciences. To do this, the chapter displaces the traditional discussion of the (bio)capitalist corruption of epistemic work, and shows how interests are performed alongside epistemic valuations of data and methods. The chapter highlights how the actors use two modes of interest-purification, temporal and organizational, to distinguish between pure and interested science. However, this value purification collapses in the face of the simultaneous and divergent evaluations on what constitutes 'good science'. The chapter stresses how dichotomous thinking about divergent interests in the life sciences breaks down in the face of the work done to coordinate and delineate different orders of worth. Specifically, the chapter focuses on the studied actors' performance of science as a moral or political project and how epistemological yardsticks—such as antibody-specificity or experimental replicability—are intertwined and contrasted with other yardsticks—such as production efficiency or medical utility. The questions that the actors grapple with are 'What constitutes good science?' and 'What should the life sciences be concerned with?'

In Chapter 12, Claes-Fredrik Helgesson and Linus Johansson Krafve investigate the various arrangements used to gather data in three clinical registry networks. Each network is made up of several researchers and clinicians at different sites who collaborate to collect observational data into a unified registry of patients with a specific condition. Their analysis shows how the registries examined accommodate both more exchange-like arrangements—where clinics delivering data might be recompensed financially and/or with co-authorships—and relations involving other parties such as laboratories. They furthermore observed that the work to gather and transfer was related to a variety of articulations as to how participation was valuable to those involved in the gathering and transfer of data. They conclude that the apparent integrity of the large-scale registry networks examined appears not to be the result of a widely shared moral economy, but instead rests on the accommodation of a number of different and partially overlapping arrangements that furthermore enacts a variety of values.

In Chapter 13, Isabelle Dussauge explores models of the desiring brain in neuroscience. The contemporary neuroscience of sex and emotions describes the desiring brain as a valuation machine—a machine which attributes value to different scenarios or possibilities of action, and processes these values to favour expected outcomes or behaviours. What values does this cerebral valuation machine produce, handle, weigh against each other—in the neuroscientific model? In this chapter, Dussauge enquires into the economic metaphors used to describe the desiring brain and through it, desire itself. The chapter analyses the consequences of the economization of emotion and behaviour in neuroscience. It also addresses how the models either pit non-economic against economic values, or integrate them together. This text addresses a powerful scientific account of what set of values constitutes life, and furthermore, of what makes a good life: the dynamics of desire and happiness made neural.

In the concluding chapter (Chapter 14) of this volume we take a few more steps in outlining a pragmatist take on values. Here we take as point of departure the empirical work achieved in the chapters. We attempt to mobilize the points and analytical moves made in order to propose how studies of value practices can be done so as to introduce the notion of valuography to denote a broader research programme for the empirical study on the enactment of values. This notion is then grounded in a pragmatist analysis of the making of values in the plural. How is the question ‘What comes to count as valuable?’ answered in practice?

Value Practices in the Life Sciences and Medicine

edited by

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