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Externalism

Identity ('Me' is 'We')

Culture in the broadest objective view appears sub specie evolutionis as a self-maintaining system or organisation of interconnecting human beings and their products, or if we wish to be a little more precise, of the results of the intercommunication of the minds of human individuals in society.

Julian Huxley 1955: 11

At the foundation of cultural science is the concept of 'externalism', which is in essence a claim about the cultural nature of the individual; about what they know, how they know it, and who they think they are. Cultural science departs from the long tradition of art history and cultural criticism (to say nothing for the time being about the behavioural sciences) that ascribes creativity and therefore culture to individual talent. During the nineteenth century, when doubts about the divine began to bite socially and politically as well as philosophically, culture provided a get-out for emergent nation-states, whose prosperity was increasingly tied to industrialization and market forces. It decoupled religious expression from causation by supernatural agents, but it retained ritualized practices of reverence towards individual 'inspiration'. It encouraged admiration for artistic genius, as a secularization of the category of the soul (or 'spirit'). It put culture ('perfectibility') in place as a *purpose* for modern nations, replacing the teleological doctrine of the divine Last Judgement or final cause. It was backed up by ever more elaborate cultural institutions (galleries, theatres, opera houses, museums, libraries . . . and, later, broadcasters), as the secularization of the category of the church, whose grandiose architecture and clerical bureaucracy they inherited. Thus, at micro, meso and macro levels (Dopfer and Potts 2008) – at the level of the individual 'soul'; at that of institutional form (where cultural institutions literally replaced medieval cathedrals in both splendour and popular

recourse); and at that of macro-societal ‘purpose’ – culture was captured by religiosity functions, albeit in institutions that disavowed religion itself in favour of doubt, distrust and diversity.

If culture is not a secularized religion, then what is it? Our starting point is that although we accept that culture is distinctively human, at least in the elaborate forms we now observe, it is not of any individual human’s making. Culture is a system-generating mechanism that everyone uses but no one invents, the model for which is language. In short, we must look for culture at the level of communicating groups and systems, not individuals; and we must revise our understanding of individuals to explain their ‘groupishness’.¹ Because of the sacralization of culture, and its conversion to an individual property right (copyrighted creative talent), the alternative is hard even to grasp. But that is our starting point: that individual talent is an *outcome* of culture, and that culture creates not works of art, talented individuals or even ways of life, but *knowledge-making groups*, which work as complex systems within which individual choice and creativity are produced, such that ‘culture makes us’ rather than the other way round.

The concept of externalism distinguishes a cultural science approach from other ways of conceptualizing culture (Herrmann-Pillath 2009, 2013). We’re not advocating yet another version of the individual-as-cause (‘the’ brain, ‘the’ mind, ‘the’ rational-choice agent, etc.), but seeking the causal agency of the reproduction and growth of the talents that individuals express. We argue that that agent is culture.

Externalism is a simple idea: it is that the individual brain is *constituted* in its networked relationships with other brains and with extra-somatic knowledge (outside the body; e.g. technologically stored). The brain cannot be understood behaviourally (by what it does as an isolated organ), or through methodological individualism (explaining social phenomena by taking individual intentions, choices and actions as their source), or by appeals to individual talent (genius, inspiration, imagination). It can be explained instead as an agent or ‘node’ in a complex communicative network, which is never as small as ‘one’ but also not as extensive as ‘infinity’. Barring accidents, all humans are raised in a social setting that includes non-kin as well as kin, and from birth they are ‘embedded’ in mediated sociality via various institutions, the most important

¹ The term ‘groupishness’ has emerged in debates among evolutionary psychologists and others about ‘group selection’. A good introduction to the term would be to search it in the debate staged by *The Edge* in 2012, here: <http://edge.org/conversation/the-false-allure-of-group-selection> (comments by Dennett, Delton, Haidt, Dawkins and Cronin).

of which is language. Thus, the ‘linked brain’ is formed in childhood across a finite number of real and virtual social relationships, with kin, neighbours, chance and media (see Chapter 8: ‘Waste’). Just as starlings mass in millions but each bird only needs to ‘shadow’ seven of its neighbours to achieve the astonishing synchronicity of a 5-million strong flock,² so humans learn how to act synchronously across a culture by attending to a proximate group that we call a ‘deme’ (see the next chapter). Culture is produced and maintained by the externalized or linked brain acting in concert with others in the deme, and the result – culture – coordinates the actions of millions. In short, individuality is produced by a complex of interacting systems; it is not pre-given by nature.

Self-creation

The concept of externalism can be understood as a species of *autopoiesis* – self-creation. This is the social-systems theorist Niklas Luhmann’s name for the process of continuously reproducing identity by filtering meaningfulness from the external environment through communication (Luhmann 1986; after Maturana and Varela 1980), thereby creating a boundary between the self and the other within which selfness can develop. He argues that this is the defining feature of social systems: they *self-organize*, and reproduce themselves, with communication. But Luhmann makes autopoietic organization an attribute of systems, not of life. In fact he makes a ‘sharp distinction between *meaning* and *life* as different kinds of autopoietic organization; and meaning-using systems have to be distinguished according to whether they use *consciousness* [psychic systems] or *communication* [social systems] as modes of meaning-based reproduction’ (1986: 173; and see Geyer 1994). Thus, for Luhmann, consciousness and communication are not strictly speaking attributes of life but of systems; *meaning* and *life* are not reducible to each other, as the Monty Python crew discovered at about the same time.³ *Social* systems are based on communication, while *psychic* systems are based on consciousness – and these are not reducible to one another (just as *aggression* is psychic but *violence* is social: Malešević and Ryan 2013). It follows that social systems are not based on individuals, their perceptions or even acts; they are constituted in *communication*.

² For starlings in action, see: <http://video.pbs.org/video/2365072926/>

³ *Monty Python’s The Meaning of Life* was released in 1983. As many readers will know, the plot device used to inquire about the meaning of various stages life is a tank full of philosophically curious fish (in a restaurant) with the faces of the Pythons.

Communication synthesizes information, utterance and understanding; and of course it requires actors to communicate, so individuals are certainly involved, but what Luhmann is getting at is that self-organization and reproduction are functions of systems (populations), not individuals. Individuals use communication to reduce complexity by creating a boundary between themselves and the outside world, and they are constituted through their act of communication with that environment. In so doing, they also construct the outside world through which they know themselves. They are thus self-reflexive – able to observe as well as to act – and Luhmann sees this as a general feature of autopoietic systems, which are cybernetic (self-steering, using feedback loops), not based on testing observations against other, external observations (i.e. rationality). All observations about society are by definition self-observations (Geyer 1994). Self and system are not distinguishable. ‘Culture’ is a group-scale class of self-creating system.

Communication creates individuals

Using this approach, Luhmann analysed various social systems, such as the economy, the law, science and art.⁴ In one of his many books, *Art as a Social System*, he criticizes the Western tradition that relegates ‘perception’ to a lower status than ‘reason’, allowing perception to animals but reason only to humans. Luhmann argues the contrary: ‘One could argue that a comparison between humans and animals demonstrates the evolutionary, genetic and functional priority of perception over thought’ (Luhmann 2000: 5); that is, it is important to distinguish *perception* (as ‘the special competence of consciousness’) from *communication* (the social system). He goes on:

A creature endowed with a central nervous system must succeed in externalizing and constructing an outside world before it can begin to articulate self-reference on the basis of its own bodily perceptions as a result of its problems with this world. (Luhmann 2000: 5)

In other words, all creatures (great and small) must establish a *communication system*; it’s this that allows them to perceive and thus deal with ‘problems’ as they arise. That’s the origin of knowledge (Figure 2.1).

⁴ See *Wikipedia*: Niklas Luhmann.

Figure 2.1 Autopoiesis – Inter-system Communication as the Origin of Knowledge (Image: Amanda Gregory 2006).⁵ Reproduced from *Management Decision*, 44:7. © Emerald Group Publishing Limited, all rights reserved.

In this apparently remarkable feat, living organisms behave merely as chemicals: for autopoiesis is a chemical process, where the minimal autopoietic system is visualized as shown in Figure 2.2.

Stano and Luisi (2010) comment that their model (Figure 2.2.) ‘aims to investigate the minimal requirements for molecular systems in order to display some living properties, while it finds relevance in origins of life studies and in synthetic (constructive) biology’.

This manner of self-organization also can illuminate culture, although human culture has also developed mechanisms and technologies for *externalizing knowledge*, forcing individuals to rely on exosomatic systems, structures and stores for vital, life-preserving know-how and connectivity. These external systems are also ‘self-created’ by the human organism, but they are not stored within each specimen; rather they link specimens to species to environment. The ‘observing consciousness’ that makes us think we’re the authors of our own thoughts and actions, and that the world is as we perceive it, is in fact the product or outcome of a prior process of external and internal system communication, meaning-filtering, boundary-creation and *thence* perception (the starting point of consciousness) that our species has inherited from much earlier evolutionary systems. In other words, self-organizing systems are ‘natural’ in the *geological*

⁵ See: 0010440707001.png.

Figure 2.2 Autopoiesis is Chemistry (Image: Stano and Luisi 2010).⁶ Reproduced from *Chemical Communications* (Cambridge), 46:21 with permission of The Royal Society of Chemistry.

sense (Vernadsky 1938, 1943). With Luhmann, we distinguish between psychic and social systems. Culture is the means by which externalized social systems are produced and organized; and that is the mechanism for producing the kind of information that can be shared among humans, namely knowledge.

Conciliating culture and knowledge: The cultural science approach

Since the nineteenth century, the concept of culture has become increasingly restricted to its status as the values-based opposing pole to the material world

⁶ Source: <http://pubs.rsc.org/en/content/articlepdf/2010/cc/b913997d> (image at page 3640). The explanatory caption to Stano and Luisi's figure reads: 'Autopoiesis and minimal autopoietic systems. (a) The circular logic of autopoiesis as minimal life. The process of living is seen as cyclic, one in which the internally produced molecular components assemble into the self-bounded functional structure, which generates the microenvironment reaction (metabolic) network, which then produces the molecular components. . . and so on. The system exchanges energy and matter with the external environment. (b) A minimal autopoietic system is constituted by a self-bounded system, which can uptake a precursor P from the environment, transform it by one or more reaction(s) into the boundary element S, which can also undergo a degradative process to W. Depending on the relative rates of these processes, the autopoietic system can grow, stay in a homeostatic state, or die'.

of industry and science. Yet this sacralizing concept of culture has become a serious impediment to understanding culture in a different way. That is why, in the 1960s and 1970s, Raymond Williams took it on, and argued it to a theoretical standstill. Over a number of important publications (e.g. 1958, 1960, 1977) he challenged 'high' culture (the concept, not individual artworks), by introducing the anthropological concept of culture as 'whole way of life'; or as he put it, 'culture is ordinary'.

Compelling though this work is,⁷ backed up by subsequent cultural critics who sought to modernize the concept in order to investigate the culture and media of the modern, urban, industrial and popular classes (and so to invent cultural and media studies), it was only partially successful. That is because the apparatus of public and private patronage, the training institutions of universities and conservatoria, and the market in literature, fine art and serious music, all retain a practical (if not intellectual) commitment to culture as 'the sacred wood' (Eliot 1921). Which government, university, city – or banking corporation – does not have its own fine art collection, sponsored concert hall, or literary prize? That's how you can tell the winners. Thus, these edifices spread all over the world, extending to ambitious emerging countries like China, whose investment in cultural infrastructure since joining the WTO in 2001 and winning the 2008 Olympic Games has been nothing short of staggering; capped off, naturally, by a new French-designed Opera House.⁸

It is not our purpose in this book to fight over the relative merits of high and popular culture (there's plentiful literature on that topic). Rather, we mention the sacralization of culture as an impediment to its reincorporation into the domain of *knowledge*; and thence, within that context, its reconceptualization as an *evolutionary* concept. Here, it is not sufficient simply to change from one horse (culture) to another (evolution) and ride off into the Darwinian sunset in the company of a posse of evolutionary bioscientists, anthropologists, linguists, psychologists and the like, because their conceptualization of culture, while evolutionary, does not carry with it what was important about the 'best that has been thought and said' (Arnold) or 'great tradition' (Leavis) version of culture: namely its commitment to understanding and contributing to the production of meaningfulness, by analysing identity, sociality and humanity's place in a changing world. Thus, a cultural science approach to culture is still interested in 'culture as value', but it asks how that type of meaningfulness has emerged,

⁷ Hartley (2012: ch. 2) calls Williams' work Cultural Science 1.0.

⁸ http://theatrebeijing.com/theatres/national_grand_theatre/

how it changes and, crucially, what it is used for. For this, it isn't necessary to set up art in opposition to evolution – culture versus civilization, or poetry versus science. The history of scientific and artistic endeavour is the same history; the institutionalization of the so-called two cultures stand-off, in C. P. Snow's now venerable but still inaccurate phrase (Edgerton 2006: 197–202), is a problem of bureaucracy, not of knowledge as such.

How, then, may it be possible to reconcile the study of culture as inherited from cultural criticism with that inherited from the sciences? How may we promote consilience in the domain of knowledge, and understand culture's role in its growth? The answer is to attempt a 'history of ideas' approach to culture as well as to science, which will show fairly quickly that the two systems, while very different and aware of their own boundaries, were nonetheless symbiotic and intertwined, such that arts could generate sciences (as Konstantin Tsiolkovsky's invention of rocketry was inspired by Jules Verne), and science could generate art (e.g. the William Dyce painting considered in the opening chapter). More important, both art and science have attempted to solve the same problems of knowledge. In order to shift from 'two cultures' to 'consilience', it will be necessary to do more than dump previous work on culture, as Alex Mesoudi's (2010: 9) 'tree-of-knowledge' diagram of evolutionary approaches to culture seems to do, since 'cultural studies' (or any humanities-based knowledge) is not included in it; or as Bednar and Page (2007: 65–6) appear to do when they dub culture mere 'suboptimal behaviour', falling short of rational choice because of prejudicial customary ideas. What's needed for a true consilience is an approach that recognizes culture as *part* of the growth of knowledge, and adds *meaningfulness* to the sciences' unconvincing reduction of knowledge to 'ideas' or 'information'. Thus, a cultural science approach to the *evolution of meaningfulness* proceeds on the basis of what we might call:

The 10 Recommendations⁹

1. The social production of meaningfulness works through the principle of the *agent as an intentional system* (shorthand: purposeful, performative individual; but not a hypostatized 'soul' or 'mind'), acting with intention. Such agents comprise groups (e.g. firms)¹⁰;

⁹ We did not coin this odd-looking word. It belongs to the 'wisdom of crowds' as a term to describe what web users would recommend in a given context.

¹⁰ An agent may be a thing, as in Actor-Network Theory (e.g. Latour 2005), which insists on the agency of non-human actors (thus, technology can be an actor). This challenges the notion of

2. Such agents, all of them interconnected to others via various webs of signification and time-based interaction, *produce meaningfulness*: semiosis in any medium that expresses all three dimensions of identity, sociality and meaning at once. That product is not only internal, subjective filtering and processing of information into meanings upon which the agent can base knowledge and actions, but it is also external, objective: it can be 'read', and '*reading meaningfulness*' in others is one of our species' special talents (associated with our big brain, long childhood, care by non-kin, and need to act socially in order to survive).
3. That *productivity* – and the ability to 'read' it – belongs to all of the agents in the system, not just to 'elite' or 'talented' ones: it is productivity at the level of populations, not persons.
4. In turn, productivity, whether it is 'making sense' or 'making money', is *technologically equipped*, operating through 'readable' networks, languages, media, repositories and practices, which themselves are made of combinations of components that include 'artifacts, socifacts and mentifacts' (Huxley 1955: 10).
5. These technologies are both *somatic* (internal to the agent-system; e.g. language) and *extra-somatic* (externalized; e.g. tools; libraries), 'interanimated' (Richards 1936) like John Donne's lovers' simultaneously embodied and disembodied 'souls' (their 'observing consciousness' in Luhmann's terms, conjoined with their capability for action).
6. The intentions of agents, the productivity of systems and readability of products, together with technologically assisted processes, result, via 'cumulative sequence' of actions, in various more or less generalized *rules or institutions* (which are Huxley's (1955) 'socifacts'), including 'institutions of language'.
7. These rules organize the emergence, assessment, adoption or rejection, and retention or socialization (distribution throughout the population), of *newness*.
8. This, in turn, requires attention to *dynamics, change and choice* as creative processes, where the arrow of time (linear causation) and feedback loops (non-linear causation) intersect at any given point. The process of governing or regulating such dynamics is called 'auto-communication' (Lotman 1990, 2009) – the self-description of systems and cultures that

intentionality, because although non-living systems may be both self-creating and evolutionary (technology, again), they cannot be ascribed intentions in the usual way. Having said that, human agents may act meaningfully without intention (as for instance, when they are *unwitting* agents of some catastrophe), so the 'agency' of intentionality should not be overstated.

makes communication *reflexive, recursive* (building on itself), and able to stabilize.

9. The outcome is that unstable set of arrangements which we call *culture*. Culture is a property of *groups* of meaningfully connected non-kin (which we call 'demes' – see the next chapter).
10. This culture is thence a *knowledge input* into individual agents as intentional systems. Extinction is not the same process in culture as in biology – cultural forms remain available as resources for newness, long after their original use is expired (Lotman 1990).

It will be noted that there is a cascading logic going through the enumeration: you cannot have Recommendation 9 without the previous 8, and 9 is not the end of the process because there is feedback. It is this cascading logic that we want to emphasize here: later in the book we plan to introduce some new terms (note subsequent chapter headings) that further specify culture in relation to groups and the interaction among systems, but at this stage we are simply seeking to 'model' culture as a process for producing *newness* (Chapter 7). This is where we differ from both the 'high' culture approach to culture (which focuses on culture as heritage) and the evolutionary approach to date (which is behavioural rather than knowledge-based). Our concept of culture seeks to account for the emergence of the new, across whole biological subpopulations (demes), and the role that meaningfulness plays in the growth and diversification of knowledge.

Linked brains and externalized knowledge

Where the high-culture approach is interested only in the talented individual, and evolutionary approaches are not interested in individuals at all but only in populations, we seek to solve the problem of the individual by holding purposeful agency and complex system in productive tension. The justification for doing that is the concept of externalism, which explains human 'groupishness', drawing analytic attention away from the individual-as-cause towards a consideration of the system-as-cause. Groupishness involves transmitting what Vedres and Stark (2010: 1152) call 'interwoven lineages' across time (across generations, in fact), through a dynamic process of 'interweaving' that cannot be discerned if individual behaviour alone is studied. Vedres and Stark apply this 'ability to recognize pattern in historical network data' to 'phenomena with low levels

of institutionalization such as social movements, emerging industries, or new schools of scientific or literary thought' (2010: 1185). We generalize the idea of interwoven lineages of loosely institutionalized group-made knowledge to encompass *culture as innovation*.

In relation to 'the brain', externalism proposes that it is not the individual brain that produces the network, but the networked brain that produces the individual. The idea comes directly from evolutionary biology (for the brain), combined with complexity theory (for the network). Evolutionary biologist Mark Pagel (2012: 12) calls 'a group of people, somehow organized around an identity', a 'cultural survival vehicle', for which a more familiar term is 'tribe' (our preferred term in this book is 'deme': see next chapter). Pagel notes that the human 'disposition' to form into these groups is a phenomenon that has held throughout our evolutionary history. He comments: 'it can be difficult to shake the habit of thinking we are the main players in evolution rather than our genes, but your body is not replicated in your offspring; rather your genes are'. He goes on to explain that humanity has actually evolved a more complex vehicle even than the body:

When I use the term cultural survival vehicle, it is to capture the idea that our species evolved to build, in the form of their societies, tribes, or cultures, a second body or vehicle to go along with the vehicle that is their physical body. Like our physical body, this cultural body wraps us in a protective layer, not of muscles and skin but of knowledge and technologies, and . . . it gives us our language, cooperation, and a shared identity. (Pagel 2012: 12–13)

For Pagel, culture is the driving force of human identity; which is the outcome of that process, not its agent. What's more, our identity is carried in phenomena that exist outside of our individual bodies: it's made up out of language, cooperation, knowledge, technology and group relations and interactions, not something bodily that somehow precedes all these. Methodological individualism has it the wrong way round. The rational individual of theory, which Thorstein Veblen wonderfully named the 'self-contained globule of desire' (1898), is no more than a carrier for culture.

Further, once embarked on the road of cultural evolution, much of what evolves is independent of individuals. As Brian Arthur (2009) has compellingly demonstrated, technologies too are 'autopoietic' or self-creating, evolving by combining (or 'interweaving') components of previous technologies into new more complex systems (also Ziman 2000). It takes agents to do that, so his example, the jet engine, has to have its Frank Whittle, but every component in Whittle's invention

already existed as an element of something else within the technological repertoire to hand. It is *technology* that evolves, not the genius who invents.

We take seriously the evolution of sociality (the ‘instinct’ that Darwin saw as founded on ‘sympathy’), through which the growth in size and complexity of the human brain – and human groups – occurs as part of that species’ adaptation to rapidly changing environments. These adaptations enabled humans (hominins) to be able to work together collaboratively, imaginatively and technologically (Dunbar 1998; Boyd and Richerson 2005). Something caused such traits to survive natural selection. That something may be specified by function: evolutionary biologists have pointed to the need for cooperation to permit our extended childhood (itself required to let our big cranium grow, post-partum); to facilitate hunting parties (seven seems to be the magic number); and to allow for the development of our relatively enormous, energy-guzzling brains (Konner 2010; Bowles and Gintis 2011). These giant networks seem acutely attuned to the requirements of sociality – learning, a ‘theory of mind’ (apprehension of the intentions of others), and language. Through them, that trait which Darwin thought could ‘hardly be overestimated’ could all the more readily be expressed; namely the ‘love of praise and the dread of blame’. That, in turn, is explicable as a mechanism for inculcating sociality in a species where survival required groups, not individuals, to make decisions (get food), and to reproduce (care for infants), using a mode of communication (language) that must carry culturally interwoven knowledge along with individual ‘costly signalling’ (sexual display), such that ‘praise or blame’ is bestowed where it is deserved, by a social community whose capacity for scepticism and doubt must exceed the reach of boasting or deceit but not extend so far as to miss out on a promising novelty – a trick that can only be achieved by the externalized brain (knowledge networks) of a group that knows itself and its own meaningful resources.

Mark Pagel (2012: 38) believes that ‘social learning’ is a key concept. To emphasize its importance, he points not just to our ability to copy the behaviour of others, which humans share with crows (doubtless an underrated species), but also to two more dynamic and impressive abilities: first, our ability to emulate the *new* (we can copy patterns not previously encountered); and second, to *improve* on it (‘copying’ is creative). When these features are isolated, it’s easier to see that ‘social learning’ is not just a matter of internalizing inherited rules, norms, and so on, but also a playful, creative and competitive process; part curiosity about the world and its changes (‘what’s new?’); part social one-upmanship (‘anything you can do I can do better’); part innovation (‘stealing a march’); part Trickster

(Hyde 2008). You don't just copy a tool (better arrow-heads: Mesoudi and O'Brien 2008), a dance move (Gangnam Style),¹¹ a fashion novelty (this season's 'look') or an idea; you look for angles, and chip away at edges until it's sharper, lighter, more fit for purpose, and more likely to bring you praise and repute among your group (nowadays abstracted and translated into the universal 'language' of price).

The group may also want to hide it from outsiders, especially if it's really good. In culture, aggressive 'borrowing' and defensive secrecy are very common. In economics, the prevention of copying, such as trade secrets and copyright, in order to maximize the profits that one idea or process can yield, is called 'rent seeking'. In both, the secret has a habit of slipping out; copying-and-improving is endemic. It can lead to a stylistic arms race, but that process too is useful (productive) at system level, as competitive experimentation. One individual can 'win all' for the time being (i.e. most players lose most games), but the group adopts and retains the 'New! Improved!' idea as general knowledge. 'Natural selection' (by waste) and 'sexual selection' (by 'costly signalling') converge in social learning, for which the beneficiary is the group (firm, deme or culture).

Inevitably, that insight, stressing the importance in decision-making of learning from and copying others in a social network (or 'herd'), has now been taken up in marketing (Earls 2009); and from there re-introduced to cultural and evolutionary theory (Bentley et al. 2011), making marketing one of the first areas of 'applied' cultural science (see also Ormerod 2012).

Hence, cultural science takes evolutionary biology seriously by embracing the concept of 'externalized' identity – an *externalized brain* – for *H. sapiens*. The brain itself evolved to deal with complex interactive communication, not just for cooperative hunting, but also for care for non-kin (given our long childhood), social learning, and the kind of adaptability to new environments that let the species move out of a specialized African niche and into generalized global capabilities. This move saw it eventually occupy very different geographical, ecological and historical sites from those in which it had evolved. None of these can be explained without the concept of externalism, or 'linked brains', that create identity from group knowledge. The human animal cannot live without the core evolutionary cultural unit that we call a deme (a 'meso' phenomenon, in the language of Dopfer and Potts 2008). Culture makes demes (groups of meaningfulness) and demes make knowledge and individuals. In the next chapter we explain how this works.

¹¹ First YouTube video to exceed two billion views: www.youtube.com/watch?v=9bZkp7q19f0.