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Waste

Reproductive Success

And consummation comes, and jars two hemispheres.

Thomas Hardy 1915

On the efficiency of cultural production

In this chapter, we examine a function to which evolution as a process is indifferent, but for which it supplies the mechanism: successful reproduction. Contemporary evolutionary theory relies on three types of selection to explain reproductive success: natural selection, sexual selection and kin selection. We will come to these shortly – and plan to add *cultural* or *demic selection* (akin to *group selection*) to the list – but first, we want to bring a little-discussed feature of reproduction into the discussion, which is waste. Reproduction is usually measured, and so it should be, by its success – the individual reproduces; the species survives. In the process, however, we find a *scale of productivity* that reaches well beyond the human power of imagination. But most of that productivity is wasted. Whether you're looking at life or artifice, most attempts at reproduction fail. The most valuable product of any species or system, the very vehicle of its future – children and brainchildren alike – wind up as nutrient for competitor species, or as lifeless sediment. They never come to fruition. They're lost, rejected, eaten, stolen, infertile, unused, forgotten . . . dissolved into other life-forms or dumped in landfill. Success is valued, but its *efficiency* goes unremarked.

In this chapter, we want to put these two facts alongside each other: exorbitant creative productivity on the one hand, wastefulness beyond imagination on the other, to ask: What is this apparent inefficiency *for*? Evolution is an indifferent process. Does its indifference extend to efficiency? Or does that combination – productivity and waste at scale – perform a fitness-enhancing

function in the successful reproduction of complex adaptive systems? In short, what is the *use* of waste?

Understanding the evolution of complexity (artistic, biological or otherwise) requires attention to *systems* rather than to *individuals*. In conditions of change, uncertainty and dynamism, not to mention competitive and predatory neighbours, something other than individuals is required because, like most of their offspring, individual creators are wasted too. Whether we're discussing biological creatures or human creativity, the *creator* does not survive in the *creation* – offspring and artwork alike owe nothing to the process or agents that made them. It's not the parent or artisan that survives, only their handiwork. The real question is the one posed by Yuri Lotman: '*How can a system develop and yet remain true to itself?*' (Lotman 2009: 1; Hartley 2012: 212–13). Perhaps the answer is simply wastefulness. It is the price of successful reproduction of complex adaptive systems – not of individuals.

The answer matters because we are interested in economic as well as in cultural analysis; in productivity and efficiency as well as in culture and language. Paying attention to wastefulness in the productivity of large-scale self-reproducing systems leads to a consideration of how it occurs, in culture (for instance, in language) and nature (for instance, in sexual reproduction). Thus, our investigation into successful reproduction in nature and culture may offer insights for economic analysis and policy too: at the very least, prompting a reconsideration of the concept of 'waste' as inefficient or unproductive. As to what it is for – the function of 'creative wastefulness' – we conclude that it is an *innovation mechanism*. It allows *newness to emerge*. And the mechanism isn't efficiency; it's *proximity*.

Inevitably, a chapter about successful reproduction is a chapter about children, both biological offspring and metaphorical brainchildren, that is, ideas and artworks. What connects *children* and waste? Certainly the process of *natural selection* is profligate. The offspring of many creatures and other life-forms (e.g. plants) are destroyed or devoured by the million; perhaps most of the children of most organisms. This apparent wastefulness is what it takes for those species to survive predation. *Sexual selection* is also notoriously wasteful, biologically and semiotically, exhibiting 'energetically wasteful displays' (Fitch 2005) with both 'costly signaling' (Gintis et al. 2001) and 'conspicuous consumption' (Veblen 1899).

In this chapter, we also consider *kin selection* (Bergstrom 2003), which brings *communication* into the picture (Fitch 2005), not least between parent and child, before proposing a further mode of selection, which we call *cultural, or demic selection*, which is comparable with *group selection* (Bowles and

Gintis 2011; Gintis 2012; Runciman 2009). Two new issues for cultural science arise out of all this: first, *communication* and waste; and second, *children* and waste. Given the high value routinely placed on both communication and children, it may be necessary to reevaluate wastefulness, from being a negative to being a positive component of culture, which has implications for economics.

Along the selective continuum, from natural and sexual selection to kin selection and cultural or demic selection, the same mechanisms are at work, whether reproduction takes place in biological systems (natural and sexual selection) or communication/cultural systems (kin and cultural selection). The long-standing habit of seeing language, culture, knowledge and meaningfulness as somehow different (or even exempt) from evolution and complexity cannot be sustained. This has implications for evolutionary science and cultural studies alike: it is no longer possible for either to leave the other out of account. Consilience is the only reasonable method to adopt in order to investigate 'reproductive success', including what it costs in bodies and brains, organisms and information, individuals and ideas, or orgasms and offspring.

Trillions and trillions

Particles, distances, stars, exoplanets . . . and thus, possibly, also astrobiological life-forms are all measured in units of 10 to the power of 12 or greater; all the way up to the so-called googol (10 to the power of 100 or 10 with 100 noughts). Despite the evidence of our human consciousness, which doesn't deal in trillions, trillions abound at the level of 'me' as well as at that of 'the universe'. It's not just that we're *made of* trillions of cells and host trillions of microorganisms, but also that we routinely *process* trillions of bits of information, incoming via our sensory organs and then filtered down to perceptible levels by our central nervous system. We're immersed in trillions; we make our unique selves up as we go along by filtering trillions. Thus, as the cyberneticist Heinz von Foerster put it: "The world, as we perceive it, is our own invention."¹ It's an invention that we create by radically reducing to something that *can* be perceived – something *meaningful* – the otherwise unimaginable scale of possibilities and probabilities in the world beyond the uncertain boundaries of 'me' and 'we'.

¹ See: www.univie.ac.at/constructivism/HvF.htm. The direct translation from the original German ('Was wir als Wirklichkeit wahrnehmen, ist unsere Erfindung') is: 'That which we assume as reality, is our invention.'

Where these trillions intersect with individual choices and actions is most readily recognized in the matter of sexual reproduction. Success relies not only on *producing* those billions of spermatozoa, but also on systems for *eliminating* most of them from the race. That being so, what should we make of all the billions of eggs and trillions of spermatozoa that don't fertilize? Are they simply wasted? It certainly looks as though this is the case (bearing in mind that one organism's 'waste' is another's dinner), and in this, humans are very far from unique. Wastefulness at the scale of 10 to the power of 12 or more is typical across many different classes of life. It can colour the planet, as when pine pollen floats down rivers and gilds entire lake surfaces in the boreal forests. Needless to say, rather few new pine trees eventuate from the many miles and tons of pollen dust produced each year. The same applies when coral spawns. So many eggs and sperm are broadcast that slicks form on the surface, and onlookers in nearby coastal resorts can mistake the result for algae blooms, or pollution. If broadcast coral eggs are successfully fertilized, they produce larvae called planulae. These may eventually settle and grow into new coral, but most don't make it: 'The time between planula formation and settlement is a period of exceptionally high mortality for coral larvae.'² They are devoured by the billion.

Large, long-lived animals and plants play the same game. They inundate predators with tasty morsels. Flowering plants beg insects and birds to eat their fruit. Turtles feed most of their hatchlings, say all but two or three in every thousand, to predators and other lethal hazards (Frazer 1992). Many of them are perfectly viable individuals, just as 'fit' to survive as those that do, but they are willingly sacrificed to the laws of chance. This system of reproduction is not about individuals but about probabilities (the probability being that individuals won't survive but the species will).

In the evolutionary arms race between predator and prey, the secret weapon for parents seeking reproductive success, to be fired indiscriminately into the mouths of waiting monsters, *are the children*. Such wastefulness may be thought to be inefficiency, if not worse. Shouldn't every child be a wanted child? But this is not a matter of species failing to evolve efficient or moral means to transmit their genes into the future. We know this because species that are among the most wasteful in this respect are also among the longest lasting. Corals go back

² US National Oceanic and Atmospheric Administration: <http://coralreef.noaa.gov/aboutcorals/coral101/reproduction/>.

to the Silurian period; trees such as the ginkgo to the Permian; and pines such as the Wollemi pine to the Jurassic.

Apparently more 'efficient' species with few live offspring, such as humans, also make a probability lottery out of reproduction, but they do it at the point of conception rather than at birth (and we should not forget the billions of cohabiting organisms from bacteria to house-mites that make a living out of our 'wasted' cells). Thus, we should not be fooled into thinking that linear transmission – in the manner of Claude Shannon's wire-based model of communication – would be more efficient than one based on scale and proximity. The spectacular wastefulness of reproduction turns out to have a function, but one that can only be discerned at the system level, not that of the individual, whose motivations, choices, desires and so on are neither here nor there as they disappear down the nearest gullet. It is this: *waste allows newness to emerge*.

Cultural efficiency

Waste is so normal in *language use* that it has never become a problem requiring a solution through scholarly research or policy solution in communication sciences. The idea of language *efficiency* never arises; we know of no branch of cultural or economic inquiry that is dedicated to the production of a 'language efficiency quotient' or of a 'coefficient of cultural performance'. Talk, as they persistently say, is cheap.

There are, as everyone knows, semiotic systems where communicative efficiency would be valued if only it could be achieved; that is, in marketing, publicity, advertising, public relations, and so on, where someone (some organization) wants the message to 'cut through', for commercial, political or advocacy reasons. But here the 'problem' is not directly linguistic or cultural. The object of the exercise is not so much to make language more efficient; its naturally wasteful tendencies are taken for granted. Strategies are directed towards *defeating* those tendencies, by sheer semiotic force. Indeed, both commercial and political communications are called 'campaigns'. The military metaphor implies that what is wanted is the *conquest* of people's attention (see Chapters 4: 'Malvoisine'; and 9: 'Extinction'). To achieve victory, that is, to create a linear causal chain between the intentions of the paying advertiser and desired alterations in the behaviour of consumer-citizens (via semiotic/linguistic mediation), requires an army. The scale of that army can be gauged by what it spends. The US

communications industry alone spent over a trillion US dollars in 2012, expected to rise to nearly US\$1.5 trillion by 2016.³ Troops of professionals are employed, marshalled and deployed by the captains general of commerce and community, augmented by political campaigners, lobbyists and myriad firms, industry sectors, reformists, associations, activists and advocates, plus entire fields of scholarly research, all dedicated to raising the low efficiency of *sending messages* (improving the efficiency of *language systems* as a whole is too hard), in whatever medium, for whatever purpose.

The best that anyone can hope for is that such high-investment messages will attract the attention of some people sometimes (without guaranteed consequent behavioural actions). Advertising really *wants* to do something to you and to make you to do something, but mostly you don't do it. So despite military strength investment, cultural and linguistic efficiency is not achieved in marketing communication, and the return on investment (improving one's share of sales, votes, attitudes) is always uncertain. Inevitably, even where investment, purpose and creative expertise are most intense (e.g. in retail sales and at elections), much of the linguistic product is simply wasted. As John Wanamaker, the so-called father of advertising, is reputed to have put it, 'Half the money I spend on advertising is wasted; the trouble is, I don't know which half'.⁴ The best the campaign industry can manage is *proximity* – they sell 'eyeballs' to their clients, because they can indeed gather populations (Hartley 1999) and amass their attention through the media. On the grounds that people like to copy high-status behaviour (Earls 2009; Bentley et al. 2011), some of that attention may convert to sales.

But even such 'reproductive success' is indirect: what happens after a signal hits an eyeball remains radically uncertain. In short, *if advertising worked, we wouldn't need it*. If it were in fact possible to get the message across *efficiently*, there'd be no call for an industry (and an academic field) continuously devoted to renewing the attempt, 24/7, across all media. If you want higher efficiency of utterance, where what is said *performs* the desired action (Austin 1962), that is, where communicative cause and effect are conjoined in the utterance, you had better train as a judge: only in such formal institutional settings do utterances successfully enact what the speaker intends (and only then because these are ritualized expressions of monopolistic state force): 'I sentence you to two years.'

³ 'New VSS Forecast 2012–2016'. Veronis Suhler Stevenson (www.vssforecast.com): www.vss.com/imgs/VSSForecast20122016PressRelease.pdf.

⁴ John Wanamaker (1838–1922), merchant; religious, civic, political leader; and sometime US Postmaster General: http://pabook.libraries.psu.edu/palitmap/bios/Wanamaker__John.html.

The reality, however, is that most sentences float by unheeded, no matter how forcefully expressed or how much is spent on them, even if they appear to be directly addressed to 'me' by a high-value representative of the 'we'-group, for example, a winsome child, pop culture celebrity, prominent public figure or suchlike secular stand-in for the otherwise indifferent gods. We ignore them all, in droves, even when the information they seek to impart is 'for our own good' – our health, well-being or pecuniary advantage. Ruthless viewer scepticism is often warranted, of course; it's a protective membrane around our very sensitive demic connectivity receptors. Even where advertising *does* work, among the proportion of the population who do take notice and subsequently act on a message, the unforeseen consequences (obesity; alcoholism; smoking-related illness) can be dramatic and not necessarily positive.

Beyond the special case of the communications and campaign industry, semiotic waste abounds. All of publishing and the creative and entertainment industries in general face the same 'problem' of not being able to achieve communicative efficiency – even when communication is their stock-in-trade. This results in the peculiar structure of those industries, which reduce risk by producing a repertoire of potential choices for consumers (Garnham 1987), because nobody knows in advance what will prove popular (Caves 2000).

Uncertainty can be reduced, for instance in Hollywood, where competition for a declining movie-audience with plenty of options elsewhere has produced a counter-intuitive strategy for risk reduction, which is to spend even more money: the \$200m blockbuster about superheroes, aliens or catastrophes is more likely to succeed at the box office (in the all-important first-weekend of release) than the \$5m to \$35m handcrafted film based on the cultural realities and human scale that made Hollywood so successful in the past (these types of movies are now called 'Oscar-bait'). Common sense might suggest that a \$35m investment in a good story that touches the audience's lives and experience would constitute a lower risk than \$200m spent on pure adolescent fantasy; but that's not the way things work in the world of semiotic productivity.

Communication doesn't work as a linear conveyance of information from A to B. Instead, most of it is neglected, rejected, resisted or consigned to the bargain bin. Talent or genius is no predictor of success. It takes luck, wiliness and time – as well as entrepreneurial energy and intensive investment – to 'win' the top spot in the rather brutal 'winner takes all' logic of the power law distribution curve that separates the blockbuster from the damp squib. There will always be one Shakespeare, J. K. Rowling, *Citizen Kane* or Beyoncé at the top; concomitantly there is a very long tail of best endeavours that miss that

mark. That logic – the famous ‘long tail’ (Anderson 2008) of ‘social network markets’ (Potts et al. 2008) – requires that most who aim for the top will be ‘wasting’ their time; but nobody knows in advance who is the time-waster or who will win. Sometimes the \$35m independent low-budget film can trump the \$200m blockbuster, so the ‘sure thing’ can stumble, but that doesn’t change boardroom calculations. As blockbusters like *The Lone Ranger* bombed in the 2013 ‘summer of doom’, more were being announced: *Pirates of the Caribbean 5*, *Thor 2*, *Fantastic Four 3* and a reboot of *Godzilla* among others.⁵ Waste is the *chief characteristic* of the entire creative production system, answering uncertainty with overproduction. This goes especially for its *most* creative productivity, because innovative, experimental or avant-garde entertainments (art) typically underrate – their risk is high; take up low. The best is often simply ignored.

Meanwhile, creative insiders have pointed to a potential new source of renewal for creative innovation: not film, but television. In a ‘revolutionary’ reversal of the historically entrenched taste-hierarchy that sees movies as an art form and TV as trash, respected actor/director/producer Kevin Spacey devoted his lecture at the 2013 Edinburgh International Television Festival to praising TV’s new ‘golden age’. He named *The Sopranos*, *The Wire*, *Game of Thrones*, *Breaking Bad* and *House of Cards* among 17 shows that comprise the ‘most powerful and inescapable evidence that the king of television is the creatives’. Here, the principle of corporate wastefulness still triumphs over innovative creativity. Most of the creatives’ ideas never make it to the screen. Thousands of scripts are presented or commissioned for US networks to be whittled down in an annual cull. Only 100-odd pilot shows are produced; of these, only tens are aired; of these, only two or three make it to season two (Gitlin 1983). This is just in Hollywood. For the purposes of Spacey’s argument, the rest of the world may as well not exist. He named only 17 shows – all American – to demonstrate a ‘golden age’ for creative success. In short, Spacey’s argument for more creativity actually amounts to a call for *more waste*. He wants industry leadership that, ‘rather than playing it safe’, is ‘emboldened and empowered to support our mission; to have an environment . . . that is willing to take risks, experiment, be prepared to fail by aiming higher.’⁶ The action he advocates – ‘If you wanna compete, you’ve got to get into the original content game’ – is modelled on

⁵ See: www.theguardian.com/film/2013/jul/26/blockbuster-film-industry-fan-base-box-office.

⁶ See: www.smh.com.au/entertainment/box-seat/in-tv-risk-is-everything-kevin-spacey-lists-tvs-best-17-shows-and-calls-for-more-20130823-2sfvq.html#ixzz2cwEvbcY2; and see: www.theguardian.com/media/2013/aug/22/kevin-spacey-tv-golden-age.

biological reproduction. This tactic entails the inevitable mass destruction of most high-investment stories to ensure success for the fortunate few. Spacey's much-vaunted creative 'kings' behave like turtles: they produce many eggs to ensure a few adults.

If the 'best that has been thought and said' is doomed to predation, consider how much less 'efficient' must be the low-stakes day-to-day communication of ordinary mortals. Indeed, most of what everyone says has no 'effect' beyond the fact of its utterance. If that is waste, then language is not only the most complex human invention but also its most wasteful. Consider this: each person speaks about 10,000 words a day. Annually, that's 3.65 million words per person. For 7 billion people, that's about 25 quadrillion (25,000,000,000,000,000) words uttered by humans each year. About 100 billion humans have ever lived; so that's about 1 octillion utterances, or 10 to the power of 27, or about the number of atoms in a human body. Conservatively estimated, each individual person utters more than 100 million words over a lifetime; and every sentence is unique. It's hard even to imagine what might constitute a 'language efficiency quotient' or 'coefficient of cultural performance', much less 'reproductive success' in this context. The scale of 'wastefulness' suggests that utterance has an entirely different value in and for a speech community; one based on keeping in touch or signalling, mostly among kin or deme, rather than offering more competition for the 'original content game'.

Children and waste

Clearly, language is not produced for *functional* purposes; efficiency doesn't come into it. But productivity does. To explore this aspect of cultural reproduction, we must turn to the role of children – the 'product' of any successful reproduction system. In this book, we see children and young people as especially important, playing a key role in the reproduction of meaningfulness within 'we'-groups. They take a lead in projecting the 'cultural survival vehicle' of their demes into the future. But here, once again, instead of finding recognition of that role and its value, we find mind-boggling waste. Indeed, at the analytical level, waste turns out to be *categorical*. The entire category of children's utterance is discounted, in life and social theory alike. It 'doesn't count' because it is mere game, play, or inconsequential make-believe, a rehearsal at best with no effect on society, politics, culture, economics or any other system beyond dubious 'learning outcomes' for the juvenile concerned.

But we think that children's utterance and play are productive of something of the highest importance for cultural survival; namely the renewal of the deme's 'we'-identity, through imitation, copying, sharing, tweaking and converting inconsequential utterance and ideas (play, day-dreaming, mischief) into new creative content and connectivity. Through such activities, the culture is reinvented every day anew by and among the peer group that faces their own uncertain future as makers of 'our' future. In short, we argue that human children are not wasteful, but productive, through their future-facing practices of integration into language, communication and culture; 'practice' here meaning experiment and rehearsal as well as action.

The idea that children are not only the *outcome* but also the *agents* of cultural reproduction (survival of the 'we'-group) is certainly counter-intuitive. But 'children' or 'offspring' are habitually regarded as an 'on-off' category (all-child or all-adult, without gradient). If the fact of humanity's long maturation process is taken into account, it can more easily be recognized that children are long-term interlocutors within family, neighbourhood and mediated communication. Completion of the parental function does not occur until a generation has been successfully reared; conventionally 25 years, which is also the age, again conventionally, at which 'youth' clicks over into 'adulthood'. The generations overlap, producing a continuous stream of children whose care, management and induction into the language and knowledge of the 'we'-community is institutionalized both within and beyond their immediate family, and whose social learning proceeds continuously as they pick up capabilities, and their language, knowledge and social networks expand. Thus a continuous slow-wave of new children – on a gradient from infant to toddler to tween; teen to 'yoof' – plays a significant and directive role in family organization, and thence in political, cultural, economic and social life more generally: but they do it, at least to begin with, largely through kin connectivity and through communication or *semiotic productivity*, not through industrial productivity as traditionally reckoned, even though children are also workers in many situations. It is in the communicative, semiotic, cultural and linguistic spheres of life that children may turn out to be productive in their own right – even as they also copy, imitate, rehearse, play and generally waste their time.

Nevertheless, children are discounted altogether in most accounts of culture, not to mention in the economy, in favour of an ideal abstract, the *rational-choice individual*, an assumed adult. Part of the reason for this assumption is that most evolutionary thinking about humans focuses on natural selection and sexual

selection, where successful mating is the object of study. Children play no role in that process, and so they are almost entirely neglected in evolutionary theory. This biological fact colours social and semiotic facts that are rather different. Anthropologically, young people are 'impotent' (Leach 1965) until their adult powers are recognized by some ritual (puberty rites, exams, departure from home/village, employment, marriage). In economics and cultural studies too, children are not granted agency. Their semiotic and social productivity is rarely considered except in terms of risk (they are construed as victims rather than actors).

But recent work on reciprocal altruism and cooperation finds that '*kin* selection', or 'inclusive fitness' theory (Foster et al. 2006), needs to be added to *natural* and *sexual* selection, as what Tecumseh Fitch (2005: 212) calls 'the most significant recent addition to evolutionary theory'. Fitch's approach is important for our purposes, because he is concerned with the evolution of *language*, and sees kin selection as an 'elegant solution' to problems encountered in previous explanations. He writes: 'communicating kin often share each others' genetic best interests, so kin selection will favor an individual (especially a parent) who can increase a relative's (particularly, offspring) survival' (2005: 213). He comments: 'it is surprising that kin communication has been almost entirely neglected as an important force in language evolution' (2005: 214).

We would add that *kin communication* is not simply a matter of top-down or one-way 'parental care' (as it is almost always construed in the literature). It involves *both parent and offspring*: two communicative 'systems' whose capabilities, interests and languages differ (Lotman 1990).⁷ Further, the 'offspring' of slow-maturation animals like humans hang around as 'children' (dependants) for a long time; they are not simply gaping beaks demanding food (stimuli to parental care), but – from the very start – they are autonomous interlocutors with a rapidly developing repertoire of communicative capabilities that they bring to encounters, and not just with parents. They may be 'impotent' (i.e. powerless) in relation to the business of the external world, but they are very active in the world of communicative invention for relationship formation and 'phatic' confirmation of connectedness (Jakobson 1960). Their stock-in-trade is semiosis: stories, movies, games, make-believe, day-dreaming, fantasy, fearful

⁷ We are not saying that parents and children speak different languages, but that, since humans are born without speech, initial mother–infant communication is by contextual and non-verbal means that Lotman calls the 'language of smiles', within which, over time, speech plays an increasingly significant role. In other words, parent/infant communication establishes a semiosphere, where mutually untranslatable languages meet (or clash), resulting in intense productivity of meaningfulness (for the baby's survival and well-being) and sociality ('bonding'), albeit with minimal verbal 'content'.

anxiety (about survival, identity, sexuality, sociality and success) and projection of the self onto the environment (including negative experiments such as teasing, bullying, sexting, hooning, etc.).

We know this because many adult inventors and innovators mention childhood or childish insights and experiences as the spur to their creative careers. Picasso was one, as recorded by advertising and art entrepreneur Charles Saatchi: 'Picasso consistently pointed out that it took him four years to learn to paint like Raphael and the rest of his life to learn to paint like a child. "All children are artists. Our problem is how to remain an artist when we grow up."' (Saatchi 2013: 255).

Someone whose adult life was driven by a childhood nightmare rather than dream was the man who 'initiated' (his word) Esperanto, the world's most successful constructed language. L. L. Zamenhof describes how 'the idea, to which I have really given my whole life, appeared to me, ridiculous though it may seem, when I was only an infant, and since then it has never left me'. What was that idea? Nothing less than an entirely new language, specifically designed to overcome the demic adversarialism (inter-group enmity) that blighted the city in which he grew up:

The place where I was born and spent my childhood gave direction to all my future struggles. In Białystok the inhabitants were divided into four distinct elements: Russians, Poles, Germans and Jews; each of these spoke their own language and looked on all the others as enemies. In such a town a sensitive nature feels more acutely than elsewhere the misery caused by language division and sees at every step that the diversity of languages is the first, or at least the most influential, basis for the separation of the human family into groups of enemies. I was brought up as an idealist; I was taught that all people were brothers, while outside in the street at every step I felt that there were no people, only Russians, Poles, Germans, Jews and so on. This was always a great torment to my infant mind, although many people may smile at such an 'anguish for the world' in a child.⁸

Zamenhof wasted no time: by the time he left school he had invented what in 1887 became Esperanto. It has survived to become by far the world's largest

⁸ L. Zamenhof, *Originala Verkaro*, ed. J. Dietterle, Leipzig 1929, 417–8. Accessible at: www.u-matthias.de/latino/latin_en.htm. Zamenhof's 'torment' was well founded. Białystok has changed hands many times, among Lithuanian, Polish, Prussian/ German and Russian lords or conquerors. Under Russian rule it endured a pogrom (1906), under the Nazis a Ghetto and deportations to death camps (1941–44). Such was the feared future to which Esperanto was intended to provide an alternative: idealistic, perhaps, but all too realistically motivated, in Zamenhof's early childhood.

constructed or auxiliary language, now claiming 2 million speakers and a place in the top 100 languages of the world. Zamenhof was doubtless an unusual child, but perhaps many more children than we normally allow are motivated by insightful observations and the will to see an insight through to implementation. Dismissed as a class, for inconsequential play, irrational irresponsibility, and impotent powers, children and their insights are simply wasted when it comes to finding solutions for today's problems. However, out of analytic sight, they are busy inventing the future, by growing their own knowledge networks; their own deme.

Wasted words?

Children are inveterate *talkers*, not only to parents and carers but also to siblings, family, kin and demic peers or 'honorary relatives' (Konner 2010: 506), in which context they create and share the crazes, in-jokes, songs, enthusiasms and other identity-markers that craft the 'we'-group of the future, and pick up all kinds of folklore – that is, cultural knowledge and repertoire.⁹ Children are active two-way or 'bottom-up' parties in the process of 'kin communication', and their interests are not necessarily the same as (or blindly imitative of) those of their parents. Further, they actively make the extension from kin to deme, as they develop sociality with non-kin through child care, schooling and informal leisure or 'unproductive' activities from attending religious ceremonies or theatrical performances to encounters in the street or on the playing field. As Nobel laureate writer Albert Camus famously remarked: 'What little I know on morality, I learned it on football pitches and theatre stages. Those were my true universities.'¹⁰ The sporting team is not just a rehearsal or metaphor for the political deme; it *enacts* players' developing knowledge of a 'we' community beyond kin.

As we've mentioned, our argument uses waste as a way of thinking through some of the issues involved in understanding how cultures evolve and survive. Among the most wasteful systems you can think of, it is hard to beat language. It is 'low cost' and unlimited – not a scarce resource but a superabundant

⁹ Pioneers of the systematic study of what children say and hear in playgrounds were Iona and Peter Opie. See: www.indiana.edu/~liblilly/shorttitle/opie.html; and hear: <http://sounds.bl.uk/Oral-history/Opie-collection-of-children-s-games-and-songs->.

¹⁰ Quotation and discussion at: <http://frenchfootballweekly.com/2013/11/07/goalkeeper-philosopher-outsider-albert-camus/>.

one, available equally to all undamaged specimens of our species, at no charge to anyone apart from the time taken and proximity required to acquire it from kin, 'honorary relatives' and others including mediated interlocutors (stars, celebrities, teachers, priests, shamans, fantasy and fictional characters); and with no restrictive distinction relating to gender, intelligence, social hierarchy, historical period or relative affluence. Barring accidents or illness, everyone talks.

Languages are however naturally 'demic'. While they offer universal access to meaningfulness to all native speakers, they entail adversarial exclusion to all those who speak a foreign tongue. Such demic difference can spawn the prejudicial enmity experienced by Zamenhof as a child, but it can also be bridged by bilingualism and translation among languages, enriching both sides. It is possible that language difference itself evolved as a kind of 'copyright protection' among early tribal groups, who sought to protect their intellectual property against competitive predation by outsider groups. Thus language difference is itself wasteful, in the sense that it requires inventive profligacy at the *system* level. There are thousands of languages (currently, 7000 known) and many thousands more that are now extinct. Whole languages are routinely snuffed out, along with their unique corpus of embedded knowledge, metaphor and contextual traces, their peculiar ways of dividing up the continua of sense impressions into meaningful units (Leach 1964: 328–9), and their function as the number-one marker of a 'we' community. They disappear, die out, or evolve into something else.

Evolutionary biologist Mark Pagel in *Wired for Culture* (2012) addresses the puzzle of why there are so many languages. Pagel comes at this problem by way of social learning, noting that 'Humans, unique among animals, are capable of cultural or social learning' (2010: 38). True enough, and two key features follow: (1) the capability of sophisticated copying of novel behaviour merely by watching. We can transmit a certain 'behaviour' to others, and they have mechanism to understand it; and (2) we know what we are copying and can infer motive, intention, and can choose to copy the best (i.e. theory of mind, plus mirror neurons capabilities). No other animal can do these things. Yet from a design perspective, this huge proliferation of languages looks enormously wasteful. Wouldn't just one language be enough?

The puzzle of the huge proliferation of language groups in human cultural evolution can be understood as an adaptive mechanism to facilitate in-group social cooperation. Language is a cultural marker for recognizing others 'of your group' with whom to extend cooperation as a way of dealing with the problem

of ‘visual theft’. Pagel explains that: ‘We have different languages because our ancestors used language to draw rings around their own cooperative groups, identifying those who are part of our own group and our knowledge from eavesdroppers in competing groups’. In sum:

To make our societies work, . . . natural selection found ways for individuals to align their interests with those of their group. . . . Humans seem to be equipped with emotions that encourage us to treat others in our societies [who speak the same language] as if they were ‘honorary relatives’. Taking this option would mean a vastly greater fund of accumulated wisdom and talent would become available than any one individual or family could ever hope to produce. This is the option we followed, and our cultural survival vehicles that we travelled around the world in were the result. (Pagel 2012: 72, 81)

The corollary is that this mechanism works by continuous creation of new language groups. This not only occurs at the level of natural languages, but more so at the level of registers, idioms, accents and ways of speaking, and via other forms of social signalling and cultural text. The production of novelty and newness can therefore be understood as a mechanism to maintain or regenerate spheres or webs of in-group cooperation. The ‘product’ of language, then, is not wastefulness but demic identity.

As a species, we seem to be ‘irrationally enthusiastic’ about *producing* language, but much less adept at ‘consuming’ it. As quickly as oratorical, narrative, musical and other forms of communicative ‘costly signalling’ are evolved within a community of language users, it seems that observers are just as quick to evolve an equal and opposite capacity to discount, ignore or suppress them. There are thousands of courses on ‘creative writing’, ‘public speaking’ and the like, and entire disciplines devoted to communicative persuasion (rhetoric, marketing), but none that we know of on ‘listening’ or ‘understanding’; or even ‘reading’.¹¹ Listening is only valued as a component of security (human hearing is more acute at night), and in sinister appropriations of that function such as eavesdropping, spying, surveillance and data-mining. Language *reception* as a social practice is typically untutored in daily life, ignored in disciplinary research and unimproved in cultural or economic investment.

Inevitably, communication is highly asymmetric; much more is said than heard. Small wonder that systems theorists like Niklas Luhmann have

¹¹ Literary education retains a commitment to astute or critical reading, but typically assumes that skill, focusing on what to read, rather than how or why, and on texts, not readers.

concluded that communication cannot be understood as a linear conveyance of meaning from one individual into another. Communication is better grasped as the means by which individuals process information relating to their proximate environment, which is replete with semiotic as well as other meaningful signals (potential food; danger; mate). Most of information received goes unprocessed by any given organism, which may be presumed to be pursuing their own purposes, otherwise not paying attention to the external environment except to monitor the integrity of their boundary with it. Much of what is processed as incoming information never reaches the level of consciousness (i.e. meaningfulness), as recent brain science continuously demonstrates.

What Luhmann calls perception precedes reason, but 'perception' itself is already a radically filtered *representation* before we perceive it. Perhaps this is why languages and utterances alike are so redundant, verbally and grammatically, where repetition (the phone always rings twice) seems to concede in advance that no one's listening, therefore that most of what is uttered, and not just by advertisers, is wasted; and the enunciator – not to mention the system – knows it will be. Efficiency would be fatal here. We are left with a species that is wilfully profligate in the *production* of language (it's all 'me, me, me!'), but radically selective in its *reception*, both intuitive and deliberate (Kahneman 2011), because only a small part of what's heard is needed or heeded for most operational purposes. Productivity, then, relies on 'successful reproduction' of meaningfulness, not just on utterance.

As the very mechanism of externalism (linked brains and knowledge) and deme formation, language unites individualism (utterance) with sociality (awareness of others) as the foundation for the 'use' of culture. This feature allows for what counts as 'individual' to be scaled, such that abstractions and institutions may take the place of natural persons (individuals) and operate socially (as communicators), so much so that we personalize abstract forces and ascribe human characteristics to firms, which produce yet more language. Thus, utterance is produced independently of human agency and context, adding to the sheer quantity of unused semiosis in the 'universe of the mind'.

Language is also structurally wasteful at the semiotic or textual level. Language is 'lies, all lies'. Anything that can be used to tell the truth can also be used to lie (Eco 1976); and therefore every propositional utterance must have at least two potential *meanings*: 'this is the case' (Wittgenstein 1922), or 'I am deceiving you' (Hyde 2008), doubling its productivity, but making it yet more wasteful in use, because half or more of its potential meaningfulness is not realized. But this kind of wastefulness is not mere inefficiency. It is built into the earliest use to which

interpersonal communication is put. The *first* 'utterance' of a newborn infant may be pure expression ('I can't breathe' . . . I'm hungry . . . uncomfortable', etc.). This generally elicits a response from the mother or carer (the breast, comforting attention, etc.). But what about the *next* cry of the infant? It *says* 'I'm hungry', but it might *mean* 'I want that agreeable and anxiety-reducing attention that my previous cry elicited, and therefore I shall repeat the cry, even though my physical condition is not the same'. Such is the first *communication* of the human infant, directed towards creating a desired response in the interlocutor-carer. It's the first 'expression' of sociality, but it's not completely honest; in fact it's a lie. Pretty soon – perhaps right away – the attentive mother will learn to distinguish 'hungry', 'tired' or 'uncomfortable' from 'attention-seeking' cries, and the infant will learn that faking it won't always make it. Mutual learning and give-and-take characterize the process of language acquisition, from the get-go. Trust is tried and tested and slowly built up in communicative action, precisely because truth is not inherent in language.

Language's duplicity enables groups to deal with truth's fugitive nature, by linking speech to community via demic 'universal-adversarial' or 'we' versus 'they' boundary-formation. It means that all propositional content needs to be heard twice, as it were: once as if it is true (hopeful, inclusive, familial, 'we'); and once as if it's a lie (fearful, external, competitive 'they'). Each speaker must monitor every utterance to check on the trustworthiness of other speakers, and assess propositions accordingly. Our inner journalist must ask the famous 'Jeremy Paxman' question: 'Why is this lying bastard lying to me?'¹² More subtly, we must learn how to distinguish what is 'the case' from whatever is not, without rejecting all of the latter: we're hostile to lies, delusion and illusion (discovery of which converts a 'we' interlocutor to 'they'); but we love them when they are used *within* a deme for the purposes of creative imagination (fiction, religion, etc.). The trick is to tell which is which; but the reality is that language mixes them up indiscriminately.

The childish invention of culture

Melvin Konner, in his monumental study *The Evolution of Childhood*, lumps play into a chapter with 'social learning and teaching' (2010: 500–17), pointing

¹² A famous question; but not in fact Paxman's – it has been reattributed to Louis Heren, long-term foreign correspondent at *The Times*: www.theguardian.com/media/2005/jan/31/mondaymediasection.politicsandthemedia.

out that in hunter-gatherer playgroups, 'teaching, observational learning and play are combined and, in effect, become one process' (p. 517).

Whatever the age structure of juvenile groups, play is one of their main activities. Play is a biological puzzle . . . it is generally defined as inefficient, partly repetitive movements . . . with no apparent purpose. This behaviour, combining as it does great energy expenditure and risk with apparent pointlessness, is a central paradox of evolutionary biology. (Melvin Konner 2010: 500)

More generally, he concludes that 'children socialize and enculturate each other . . . but it is not just culturally mandated behavior and knowledge that is transmitted: child groups may transmit what adults see as undesirable behavior, and they can become agents of change' (Konner 2010: 661). This squares with recent research on 'natural pedagogy' as an evolutionary adaptation (Csibra and Gergely 2011: 1150). They say:

Our proposal is that the [evolutionary] adaptation for natural pedagogy was made necessary by the cognitively opaque knowledge and skills required by technological inventions during early human evolution. This technology, including its materialization as artefacts and its know-how as expertise, was inherently cultural in nature. . . . Conventions, rituals and novel symbol systems could also be transmitted to the next generation by natural pedagogy, and the operation of modern social institutions is unimaginable without communicative knowledge transfer. In this sense, natural pedagogy is not just the product but also one of the sources of the rich cultural heritage of our species.

Culture – knowledge, technology, symbol systems, institutions – is 'transmitted to the next generation' by 'natural pedagogy', of which children are both agents (source) and product. In other words, one of the 'main activities' of children is to teach themselves and each other in pleasurable/competitive company, growing knowledge and how to use it in an intersubjective, autonomous setting (without assigned tasks). Making it up as they go along, children's purposeless interactions with kin, peers, objects, symbols, pretend and environment teach them, *inter alia*:

- The *content* of language, including meaningfulness, rules, skills and customs;
- *Sociality* in cooperation, copying, competition and conflict, including both play-fighting and play sex (Konner 2010: 288);
- *Enterprise* in risk, iteration and reward, including testing boundaries;

- *Technology*, including *institutional* rules and forms; and
- *Recursive knowledge or epistemology*, including ‘theory of mind’, ability to alter rules, interpretation, ‘collaborative learning’ and thence ‘enculturation’ (Konner 2010: 283–5; ch. 26).

They do not passively receive language, culture, knowledge or meaningfulness; they remake them anew, and they can be ‘agents of change’. In short, *what* children are ‘making up’ as they play is the *deme of the future*. Its value is ‘paradoxical’ to evolutionary biology because the ‘body’ in which it evolves is culture.

Language is the most complex system humanity has invented (although cities might also begin to stake a claim to that title). It is co-extensive with the species (we know of no human group or time without it), and yet it follows its own evolutionary path, whatever individuals think, do or say. There is no ‘rational choice’ involved in deciding which word follows another in a spontaneous utterance. Those decisions are made by the rules of the game, in this case, grammar, which is not in the gift of the speaker; and by the exigencies and immediate circumstance of utterance, to which individuals respond intuitively and emotionally, not rationally or deliberately (Kahneman 2011). Other ‘general technologies’ invented by humans, which use us even as we use them, include culture (Pagel 2012), technology (Arthur 2009), cities (Jacobs 1961, 1984), writing (including mathematical and musical notation) (Goody 1986; Ong 2012), and the internet (Benkler 2006; Barabási 2002). They too exert their own systemic causal force on individual actions, even as individuals create them. Although language is not a technology in the usual sense (it’s not made of materials external to the human body), it does seem to have been ‘invented’ at a certain point during the early evolution of *H. sapiens*, in the way that Brian Arthur describes for technology; by *combinatorial evolution*, taking existing components of the human sound-making machinery (larynx, tongue, teeth, etc.), a set of components that is itself evolutionarily distinct from that of other great apes, and using the same for new purposes, possibly based on the interactions of mothers and infants (Fitch 2005).

As with biological species, most of the languages that have ever been spoken are now extinct. But new languages are coming into existence, as we speak. As the *New York Times* reported in 2013 (and see O’Shannessy 2005):

O’Shannessy, a linguist at the University of Michigan, has been studying the young people’s speech for more than a decade and has concluded that they speak neither a dialect nor the mixture of languages called a creole, but a new language with unique grammatical rules. The language, called Warlpiri rampaku, or Light

Warlpiri, is spoken only by people under 35 in Lajamanu, an isolated village of about 700 people in Australia's Northern Territory. In all, about 350 people speak the language as their native tongue.¹³

Notice here that the new language appears 'from below', as it were – out of the mouths of youngsters under 35, not 'elders' whose cultural function is to preserve received knowledge; those who must adapt to new circumstances. Light Warlpiri is not the only new language to emerge in these circumstances. Australian field linguist Felicity Meakins has documented another, called Gurindji Kriol (Figure 8.1). She points out: 'In many remote areas of northern Australia, language loss has also been accompanied by language genesis. New Indigenous languages have emerged as a modern expression of Indigeneity'.¹⁴

Figure 8.1 The childish invention of culture: Gurindji children of the Kalkaringi community, Becky Peter, Chloe Algy-King and Nathaniel Morris, tell Felicity Meakins in Gurindji Kriol where to find a blue-tongue lizard. Photo: Peggy Macqueen © 2010. Used with permission.

¹³ 'A Village Invents a Language All Its Own'. By Nicholas Bakalar. *New York Times* (14 July 2013): www.nytimes.com/2013/07/16/science/linguist-finds-a-language-in-its-infancy.html?pagewanted=1&_r=0&hp. Lajamanu's *Wikipedia* entry suggests that the invention of the new language may be related to a Northern Territory government ban on children speaking Warlpiri at school: *Wikipedia*: Lajamanu, Northern Territory. See also: www.nytimes.com/imagepages/2013/07/16/science/16LANG.html.

¹⁴ See: <http://cccs.uq.edu.au/meakins-lecture>.

None of this can be explained by recourse to methodological individualism. Other than a desire to connect with peers, no personal motivation or choice can produce such an outcome; only the mutuality of linked brains in conditions of sociality, in short, culture, motivated by a 'desire' for the survival of the group. The same sort of rule applies also to the development of a national accent – the Australian accent, for instance, and with that, national identity. Children *must* have invented these valued components of culture, because mature speakers would have come to Australia with their own regional accent (Cockney and Irish figuring prominently). It was their children who developed the new accent from the linguistic and social mixture and interactions of the new colony, including contact with other languages, indigenous or regional; and only this explains why so many British-English derived societies have developed distinct and sometimes mutually unintelligible accents, which may themselves be evolving into new language 'species', for example, Singapore Singlish (Ansaldo 2009).

There is an important rule here that methodological individualism misses because of its focus on rational or autonomous choice. That is, that allegiance to the group forms a large part of the social learning programme that is conventionally subsumed under the heading of 'childhood', restricting it to inconsequentiality and 'play' – that is, allowing it no causal or generative force – when in fact mother–infant communication and children's peer-to-peer interactions produce and create the sociality and networks within which adult individuals operate and have their identity. Rationality and autonomy are the very properties of the adult individual that are thought not to apply to children, who are therefore, methodologically, irrational dependants, and thus are left out of account in law as well as scientific analysis.

Unfortunately, such an approach cannot account for the impact that infants, toddlers, children, tweens, teens and youth may have on the dynamics of *group* formation and survival; indeed, as the coming generation, they *are* the generative force for future survival. As Konner remarks: 'Some "evil" tendencies – idleness, fantasy, risk taking, sexuality, selfishness and violence – are vital evolutionary adaptations' (2010: 669). Furthermore, children sustain and control an 'independent' *child culture* that Konner finds to be universal among humans but unknown among animals: 'games, jokes, superstitions, chants, songs and ditties, spoken formulas, symbolic hand-signals, and homemade toys . . . riddles, jeers, curses, oaths, pranks, tricks, and pacts' (2010: 662). By these means – which include 'exercises of power through humiliation' (bullying) – children 'enculturate' themselves.

Thus, even though they should not be left out of analytic account, youngsters are not exactly the same as everyone else in a given 'we'-group. Importantly, in relation to general economic activity, they are defined by practices of *consumption* and *communication* rather than *production* and *purpose*. They don't generally make the kind of decisions that are typically analysed in economics; nor do many of them (child actors and models aside) make the performances, productions, designs and networks that are typically analysed in cultural and media studies, although they do make some of the most devoted fans and audiences. As a result, those who study both decisions (economy) and productions (culture) simply omit children and young people from their frameworks of analysis, except as consumers. But in this context 'consumption' doesn't mean what it might do in relation to a packet of crisps: 'consumption' is not the 'end-use' of a product. Instead, cultural and media consumption by children and teens is the opening move in a turn-taking sequence; consumption here is *productive* – of group identity, individual identity and communicative sociality.

Observers are familiar enough with the passionate attachment to group identities that certain schools foster in relation to sports, debating, and other competitive activities that bond 'we'-groups, and exclude 'they'-groups. It is also well known that these activities model 'adult' allegiances such as patriotism and bonding in the workplace (the 'old school tie'; the 'playing fields of Eton', etc.); and that quite a few such activities, especially sport, survive into adulthood as lifelong markers of distinction. But the obvious conclusion has not been followed through – that childishness and tribalism are *productive* and creative; not just facing the future in 'we'-groups, but actively making 'we'-groups for the *purpose* of facing the future.

'Tribal' allegiance to sport, ceremony and competition may be mercilessly critiqued as 'arrested development' (where transition from the childish to the rational state is not effected successfully), as for example in Thorstein Veblen's wonderfully acerbic *The Higher Learning in America* (1918). But it is clear that 'adult' concerns penetrate childish or youthful subcultures, crazes and loyalties; and that 'childish' activities and affinities persist for a lifetime, colouring nations as much as persons. A common feature is 'tribalism', or devoted loyalty to a 'we'-group with attendant rituals, secret language, devotion to the egalitarian peer group (celebrated in Hollywood 'buddy movies' and Australian 'mateship') and aggression to outsiders (however defined – by gender, race, nation, age, region or competitor status). One might also note that as far as individuals go, there's a downside to arrested development – narcissism, 'mean girl' cliques, lack of

empathy for difference and pride in ignorance.¹⁵ The point here is that such ‘tribalism’, ‘childishness’, ‘youth culture’, ‘arrested development’ and its attendant playful inventiveness and crazes are all telling us something: children, not rational individuals, *invent* the future; and they do it with greater devotion to ‘groupishness’ than to self-interest.

As they play with each other via digital devices and online games, children may also be making up and shaping the kind of polity, and thus the kind of citizenship, we will experience in future (Hartley 2012: ch. 6). Common sense tells us that adult citizens – those who vote and pay taxes – are the makers and shapers of modern democracy, using some version of methodological individualism and rational choice to do it. However, we contend, on the contrary, that children exert a formally unnoticed but growing influence as they engage with one another and the wider society, both socially and online. Children are, by definition, not citizens . . . and yet they must *become* citizens if the reproduction of the system is to continue. Thus, the actual process of citizenship-formation is ‘carried’ by children who – individually, collectively and differentially – *produce* citizenship in their actions, forms of association, and thence identities. It follows that children are, at one and the same time, the least important component of institutionalized citizenship, since they remain non-citizens and non-voters; and its most important subjects, since they creatively undertake the practice of citizenship formation for the future. They are the inventors of new languages, including in-group slang, argot or subcultural style, new group dynamics, and new uses for available technological affordances and components. With the growth in digital media and communication, children are in fact becoming prime agents of *change* for citizenship, in that their unconsidered actions, preferences and unselfconscious associations may create the models for new modes of do-it-yourself (DIY) citizenship.

There’s a tacit or unwitting recognition of the potential creative energy of youthful inventiveness, which can be discerned in the attempt by adult agencies to take it over. On the one hand, cultural production is infantilized in mainstream popular culture, where the ideal demographic seems to be the peripubescent consumer, whose predilections crowd out other audience segments. Youthful day-dreaming and time-wasting are commodified into narrative or play as

¹⁵ For instance the statement attributed to the United States’ first elected woman governor, Miriam ‘Ma’ Ferguson of Texas, who was said to have opposed bilingualism in schools in the 1920s with the (probably apocryphal) quip: ‘If English was good enough for Jesus Christ, it ought to be good enough for the children of Texas.’ *Wikipedia*: Miriam A. Ferguson.

action and rom-com (boy meets girl) in cinema, in-group competition in reality TV and first-person shooters. Young people are the prize in this game. But on the other hand, youthfulness is increasingly treated as a *disorder*, psychological or social. Individual youthful behaviour is pathologized, resulting in the clinical surveillance and mass medication of children with 'too much' energy and inventiveness (ADHD; Ritalin). Instead, children are trained to present as docile but aspirational (like adults) by puberty; submissive to biopolitical self-administrative processes and achievements. Groups of young people exercising their right of assembly are routinely criminalized as 'they'-groups, gangs and mobs, assumed to be high on drink or drugs or novel ideas, or as irrational fans in need of correction. If in addition to their age they display subcultural, migrant, colour or class/gender indicators, or if they are boisterous, unruly or unrespectable, apparently they pose a moral risk to the control culture (Skeggs 2005). Local media collaborate with law enforcement agencies to produce narratives of threat to 'our' community by 'they' identities that may be made up of our own children. The governing discourses are about 'protection and correction', and the boundary of the social, which can be discerned simply by observing young people's transgression of it. There are few countervailing discursive forays (except in fantasy fiction) into the role of children and young people as *creators* of the social, extending its boundaries or adapting to change. This kind of boundary-policing is demic, of course, making sure that the future is cut off from the present, but in the meantime it sustains a growing surveillance and security industry that impinges mainly on adult culture and society as a conservative force. Dick Hebdige, pioneer of 'subcultural' studies, spells out the lesson for culture generally:

Instead of the idea that human culture is a negotiated situation, an intersubjective negotiation of difference, it's as if there's some bureau dictating that this is the metabolism that the world must have. Everybody's got to be happy so you get this dream about homogenizing the human race, to get rid of turbulent character traits and metabolisms which used to produce art and conflict and happiness. (interview in Dugdale 2004)

Playful, childish, mischievous DIY-citizenship, like other experimental forms such as art and entrepreneurship, is 'turbulent', potentially offensive, dangerous or risky, especially to established rules and rights. But that is its strength, to provide the 'turbulent character traits' associated with 'art and conflict', and thus to provoke not offence but renewal. It is arguably more democratic, certainly more productive, than formal versions of citizenship, because it is participatory,

future-facing, peer-to-peer and generated within self-organizing 'bottom-up' networks. Thus, control mechanisms that seek to 'homogenize the human race' through bland cultural products and pacified groups may be doing it serious damage, leading to another, much less productive kind of wastefulness: a waste of future openness and potential.

The extension of 'new' digital online media into the space and time of childhood, including computer-based social networks, mobile devices and globally dispersed entertainment formats, has given children's actions and choices *as a group* far more significance and influence than scholarship has hitherto recognized. For example, children's online actions are already being closely tracked by business to determine their preferences in order to satisfy their demands for various products – and thus influence the course of industry. But these preferences extend more widely than commerce, to the kind of society and association children prefer, which governments and others are starting to pick up on. In the light of this, it is of some concern that some latter-day 'child savers' are trying to restrict and exclude children's access to and participation in the online world. The future is the invention of those who are going to live in it. What's new in these developments is not that they are new, but that so much of this informal social learning from peers and group formation among child-aged communities is now conducted online, and is therefore open to investigation – and surveillance.