

Possibilities for mathematics education? : Aphoristic fragments from the past

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Possibilities for mathematics education? Aphoristic fragments from the past

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ABSTRACT: Our contribution to this special issue is not intended to offer a theoretical argument in conversation with the papers which form *The Disorder on Mathematics Education* (Straehler-Pohl, Bohlmann and Pais, 2017). It is informed by much of the thinking contained therein and driven by a similar concern with the institutionalisation (and therefore the inevitable co-option and colonisation) of the socio-political dimensions of academic research in mathematics education. However, it is intended to sit alongside as a disorderly and comparatively uninvited guest at the conversation. Rather than advocating a specific set of approaches to the teaching and learning of mathematics for social justice, we are striving after a disorderliness of format to allow the advancement of a (somewhat utopian) imagination and hope, to unsettle ourselves and others and to offer the occasional, penumbrian glimpse of 'the speculative could' (Straehler-Pohl, Pais and Bohlmann, 2017, p. 3). We present research fragments collected as part of an activist project without introduction or comment; however, alongside these, we offer more conventional text on neo-liberalism, the need to historicise the present, aphoristic thinking and the need for "somewhere" to be.

Keywords: neo-liberalism, historicise, mathematics education, activism

I. Introduction and context

In socio-political mathematics education research, it is everywhere recognised that dominant discourses hold sway largely through creating the sense that everything they propose is natural, common-sensical and could not be otherwise (Gramsci, 1971). We live in a world dominated by neo-liberal thinking - in England, over the last three decades, neo-liberalism has been particularly successful in accomplishing this hegemony. As Perry Anderson noted more than a decade ago 'there are no longer any significant oppositions - that is, systemic rival outlooks - within the thought-world of the West' (2000, p. 13).

The education system in England is now drenched in neo-liberalism (Llewellyn, 2017), almost from top to bottom (the education of three to four year-olds still has some small immunity): schooling has become a space where thinking other than about "standards" and their auditing has become almost unthinkable (about which more below); more recently higher education research has become subjected to an almost mindless adherence to "REFable"¹ grade measures of *originality*, *significance* and *rigour*, terms which have begun to be bleached of meaning; and now higher education teaching is to be subjected to a teaching excellence framework (TEF) based on measures of *retention*, *student satisfaction* and *graduate employment* with the Higher Education Academy asking "Are you TEF ready?" (<https://www.heacademy.ac.uk/services/consultancy/are-you-tef-ready-teaching-excellence-framework>) and "selling its wares" to universities. The valorisation of criteria and their disciplinary functioning 'reflects a desire to contain freedom, limit possibilities, and resist change' (Bochner, 2000, p. 266).



What a wonderful time we had, we really did. Didn't we enjoy ourselves ... Nobody thinks about making teachers' jobs enjoyable these days. (group conversation, 2016)

We will continue indefinitely to praise, to swear and to curse in every language we know.
(Berger, 2016c, pp. 142-143)

[I was at] some kind of weekend editing group ... There was this dreadful thing about how to play fraction dominoes, which was some instructions that went on for about a page, and I was trying to rewrite this. I spent about an hour and a half doing it and eventually it came up [for discussion] and [a fellow Smiler] picked it up, fell about laughing and said, 'Look at that!' scrunched it up and threw it in the bin and went on to the next one! ... this idea that *Smile* was kind of nice and liberal – it was bloody hard. People were really tough-minded in their beliefs ... You really had to be able to fight your corner and if you couldn't it was tough. (group conversation, 2016)

¹ The Research Excellence Framework which audits and ranks research in the UK (<http://www.ref.ac.uk/>)

ordering to support us in the struggle for a more just, democratic and socialist mathematics education, to enable us to act in the world. And, given the title of this journal, we perhaps also need to declare our residual enthusiasm for mathematics itself despite the 'collateral damage' (Ernest, 2016, p. 1). But these two - the search for a more just mathematics education and finding pleasure in mathematics - always already seem to become "ordering" temptations for us, temptations we wish to resist.

[It is important here, in passing, to notice just how pernicious this collateral damage is and to bring back into view what has been 'put below the horizon' (Skovsmose, 2016, p. 11): mathematics education, and mathematics itself, do significant harm in the world. Some ways in which this happens are:

- Mathematics education leaves many learners feeling inadequate, humiliated and ashamed (Bibby, 2002).
- It is used, pre-eminently, to order and rank young people, to operate as a critical filter, with such ordering and ranking then justifying and legitimating social stratifications and concomitant allocations of advantage and disadvantage. Social class has, universally in Anglophone countries, a profound influence on one's place in this mathematics hierarchy and thus the stratifications replicate the existing unequal order. (William and Bartholomew, 2004)

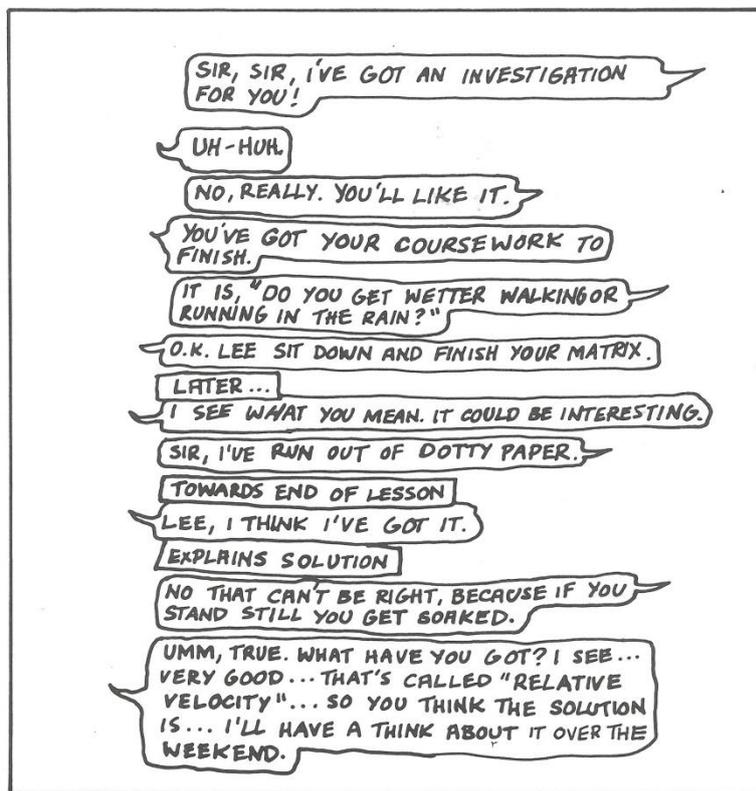
I have a very strong memory of sitting with around 20 other teachers at a Working Weekend (perhaps Friday 9th April 1982) listening in shocked silence to the news outlining the sending of the task force to the Falklands. The practical *Smile* response was to edit a worksheet on bearings (0777 *Sub Smash*) so that the content stayed the same but without torpedoing submarines as a context. Rather prescient given the sinking of the Belgrano a few weeks later ... Thatcher's anti-racist mathematics comments at the Conservative Party Conference (9th October 1987) were part of a longer rant about education:

And in the inner cities—where youngsters must have a decent education if they are to have a better future—that opportunity is all too often snatched from them by hard left education authorities and extremist teachers. And children who need to be able to count and multiply are learning anti-racist mathematics—whatever that may be. Children who need to be able to express themselves in clear English are being taught political slogans. Children who need to be taught to respect traditional moral values are being taught that they have an inalienable right to be gay.

(email correspondence, 2016)

Stories are one way of sharing the belief that justice is immanent. (Berger, 2016a, p. 96)





Lee has contributed a number of striking solutions to investigations in Splash over the years and is now in the 5th year. We think this is a nice investigation. Perhaps you could send your solutions to Lee?

Richard Hale
Holland Park School

Splash (Smile teachers' newsletter), April 1983

... how incredibly autonomous we we were ... [teachers now] have less autonomy but they haven't noticed because it's drip, drip, drip like when you put a crab into water and heat it up gradually and eventually they boil to death. (group conversation, 2016)

... we learnt so much from each other. We had so much discussion. We learnt more mathematics, we learnt more pedagogy, we learnt so much. (group conversation, 2016)

- Many applications of mathematics contribute significantly to social harm. An example is provided by the sophistication of the weaponry owned by the wealthy and deployed through advanced computer software against the poor, now creating almost certainly the greatest imbalance in history between combatants (Berger, 2016a).
- Other applications bring dehumanised thinking to social and ethical problems fostering 'ethics-free governance' (Ernest, 2016, p. 14). Such use of mathematics valorises instrumental thinking with a focus on technical means rather than ethical ends and separated rather than connected knowing. Resulting policy is seen as 'unquestionable practical reality, a necessary evil' (p. 8) which no longer has the power to shock or outrage: 'the mathematical issues become located within the horizon, and the context of the calculations becomes lowered beneath the horizon' (Skovsmose, 2016, p. 12).
- Mathematical thinking is constructed as dealing in certainties; results are necessary, objective and neutral and are found by the operation of detached rules. Exposure to such reasoning without meaning provides 'a training in ethics-free thought' (Ernest, 2016, p. 6).

(Many of the arguments touched on here are developed in some detail in Ernest, 2016 and Skovsmose, 2016).]

II Our contribution

Our contribution to this special issue is not intended to offer a theoretical argument in conversation with the papers which form *The Disorder on Mathematics Education* (Straehler-Pohl, Bohlmann and Pais, 2017). It is informed by much of the thinking contained therein and driven by a similar concern with the institutionalisation (and therefore, to some extent, the inevitable co-option and colonisation) of the socio-political dimensions of academic research in mathematics education: the conventional products of research have become commodities with an exchange value, 'alienated objects offered cheaply for sale' (Fischer, 1996, p. 68). Our contribution is intended to sit alongside as a disorderly and comparatively uninvited guest at the conversation. We want our contribution to make the reader uncomfortable, perhaps even a little embarrassed sometimes by our excesses, by presenting research fragments without textual commentary.

As well as *writing* research in ingrained ways, we also *read* research in ingrained ways that limit our thinking. Here, simply reading down the page as we are trained to do, the conventional text is interrupted. These interruptions speak over it: '[s]eeing comes before words' (Berger, 1972, p. 7). But, of course, the images do not unproblematically speak for themselves. The meanings of the images are framed by and changed as a result of their positioning - what lies beside? what comes immediately after? (Berger, 1972, p. 29). They constitute a representation, a construction, and are not and could not be the "original" of the phenomena being reported (Passerini, 2000).

The forms of these fragments, collected as part of an intended activist project (<https://smilemaths.wordpress.com/>), are visual images, stories, scraps of transcripts, aphorisms, occasional questions ... (We have written about the project itself elsewhere:



I really don't care, I don't think, what anybody knows at the end. What I care about is that they have learnt that the more you learn about things, the more exciting the world is, so they'll want to go on learning more. (group conversation, 2016)

We have to reject the new tyranny's discourse. Its terms are crap. (Berger, 2016a, p. 41)

How 'anti-racist' maths is taught

By Michael Durham
Education Correspondent

TEACHERS who encourage pupils to do sums which illustrate racial prejudice or political oppression, and teach that arithmetic has a cultural bias, were Mrs Thatcher's target when she denounced Left-wing influence in schools during her speech yesterday.

In her speech, Mrs Thatcher claimed: "Children who need to be able to count and multiply are learning anti-racist mathematics—whatever that may be."

Children were being taught "political slogans," Mrs Thatcher said.

Purge on bias

Hard-Left teachers in Inner London are behind moves to teach the highly-political form of arithmetic to children in scores of primary and secondary schools.

Out go sums which ask how many pails of water it takes to fill a bath. Instead children may be asked to calculate the proportion of unemployment among different racial groups in Britain.

"Anti-racist" maths teachers—many of whom are centred around the Inner London Education Authority's SMILE (Secondary Mathematics Independent Learning Experience) project—hold that schools are inherently racist and even maths is not culturally neutral.

They believe traditional maths is "racist" because children are taught that it is a European invention. It was developed by the Indians, Arabs and Chinese, they say.

Textbooks and exam questions need to be purged of racist "bias," and rewritten to make children aware of racial prejudice as they learn their sums.

In one textbook drawn up by ILEA's Learning Resources Centre two years ago, pupils are asked to calculate the ratio of population to land among different racial groups in South Africa.

Other sums are about the probability of a black South African miner earning the same as a white man, and the different unemployment statis-

tics among racial groups in Britain.

One senior local authority maths adviser—who asked not to be identified—said: "It is all very well teaching multi-cultural studies, but some people seem to go further."

"They take the view that the maths that you and I know is not culture-free. It is a white-race maths and the contribution of black races is being ignored."

"It seems to me to be racist itself rather than helping to promote a multi-cultural society. I thoroughly disapprove."

'Strongly political'

Mr Alan Bishop, of the Association of Teachers of Mathematics, said: "There is undoubtedly a group of teachers that feels strongly political about this and will take whatever steps they can to exploit, for example, material about apartheid in maths teaching."

Mr Fred Naylor, chairman of the Parental Alliance for Choice in Education said last night: "This is not maths. The main aim of these people is not to teach arithmetic, but to attack British culture."

extract from national daily paper, source unknown, 1987

Povey and Adams, 2017; Povey, Adams and Everley, 2016; Adams and Povey, in preparation). We are striving after a disorderliness of format to allow the advancement of a (somewhat utopian) imagination and hope, to unsettle ourselves and others and to offer the occasional, penumbrian glimpse of 'the speculative could' (Straehler-Pohl, Pais and Bohlmann, 2017, p. 3) rather than to advocate a specific set of approaches to the teaching and learning of mathematics. As will become apparent in our discussion below, it is intended that these images 'confer a new kind of power [that helps us to] understand the history of which we can become the active agents' (Berger, 1972, p. 33).

Alongside these research fragments, however, there is a more conventional text (of which this sentence is a part) which is concerned with a number of themes and it is to these that we now turn.

III Education in England, neo-liberal thinking and the need to historicise the present²

In England, the break with the post-war consensus and the beginnings of the neo-liberal project in education can be traced back to the Black Papers in Education published during the late sixties and throughout the seventies (Gillard, 2011.) With the appointment of one of the Black Papers' authors as Secretary of State for Education in Margaret Thatcher's first government, the 'brutal new capitalism' which had been in the offing (Rowbotham, 2000, p.

² We have previously rehearsed arguments similar to those contained in the first part of this section in Povey, Adams and Everley, 2016 and in the second part in Povey and Adams, 2017.

189) began to be enacted. As Sheila Rowbotham has noted, left-leaning educationalists were unprepared:

None of us noticed a be-whiskered bad fairy glowering at us in the wings.

Rhodes Boyson was about to make an entrance, flapping his Black Paper on education and fulminating against anarchy. (Rowbotham, 2000, p. 167).

Education became subject to an 'epidemic of reform' (Ball 2003, p. 215) with government interventions in the details of curricula and the introduction of a testing and inspection regime and accompanying performance league tables with high stakes consequences for teachers and schools. The 'audit ideology' (Groundwater-Smith and Mockler, 2009, p. 5) has been a key policy instrument in the neo-liberal project, recasting education as a consumer good rather than as a public service (Macpherson, Robertson and Walford, 2014).

Stephen Ball (2003) has drawn attention to three interrelated policy technologies which have been at play throughout this period: the market, managerialism and performativity. Performativity, in particular, affects every aspect of teachers' working lives (Povey, Adams and Everley, 2016):

it is impossible to over-estimate the significance of this in the life of the school, as a complex of surveillance, monitoring, tracking, coordinating, reporting, targeting, motivating. (Ball *et al.*, 2012, p. 525)

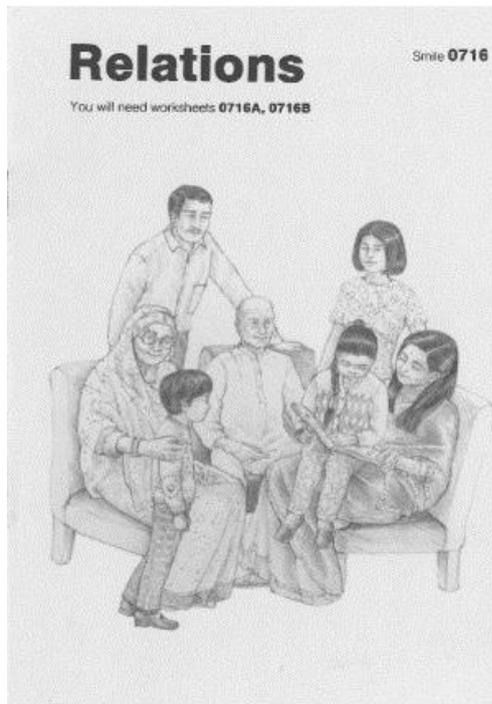
Teachers' autonomy is eroded and their individual and collective professional and personal identities are under pressure (Day and Smethem, 2009). It is not too strong to say that teachers are in the grip of the terrors of performativity and that there is a struggle over the teacher's soul (Ball, 2003). A Foucauldian regime of truth normalises the ubiquitous use of numerical data (poorly understood) to monitor and judge "performance" by students, teachers and schools (Hall and Noyes, 2009), making everything subject to calculation through 'the micro-disciplinary techniques of hierarchical observation, normalising judgements and examinations' (Hall and Noyes, 2009, p. 851).

[We believed] we were moving in the same direction as history. (Rowbotham, 2000, p. 191

The flip side of autonomy is that racist and homophobic teachers could do what they liked. (comment at a seminar, 2016)

What we were teaching, I think, before anything else, was how to live in a society peaceably and productively ... (group conversation, 2016)





I remember two really big arguments I had, one of which I lost ... which really upset me at the time ... a very early card ... when it got rewritten it was written as an Asian family ... I said why don't you use the opportunity to have a gay couple? So you just have a couple, nobody's there, nobody says anything, but they're there. I was told you absolutely can't do it because it's an Asian family and it will upset the Asians and that was it.

I was devastated because my family had a gay parent, so for me that was my family not being in *Smile* and not being in classrooms, and of course my family was never in classrooms. I was still aware that there were these children in London in classrooms whose parents were gay and nobody knew and it was the one place you could put it in, but the important thing at the time was we have to include the Asians ... but that's how people thought then, so there were times when actually it wasn't as right-on

liberal as it might have been, because there were lines that were drawn ... (group interview, 2016)

The same regime of truth disciplines teachers by demanding meticulous attention to trifling minutiae, 'a political anatomy of detail' (Foucault, 1979, p. 139). The teacher as neo-liberal subject, through the Foucauldian technology of the self, is expected to 'carefully fabricate' (Foucault, 1979, p. 217) herself constantly in conformity with neo-liberal demands (Lemke, 2001, p. 203-4), to reform and regulate her subjectivity through micro self-surveillance, working intensively on the self and coming to perform an individualised, enterprising identity (Ball, 2003). Insecurity is rife: it becomes necessary 'to compete permanently with oneself' in order to stay in the job' (Montecino and Valero, 2017, p. 150). In this world where what counts (and is counted) is what we perform rather than who we are, '[w]e are in danger of becoming transparent but empty, unrecognisable to ourselves' (Ball, 2013, p. 138).

How is this hegemony built and sustained? We recognise that neo-liberal discourse in education has colonised language to such an extent that words have lost their meaning: all students are to be above average and all teachers are to be outstanding. It appears that *mathematics for all* has experienced a similar fate (Pais, 2017, p. 55). We are left with 'the rubble of words' (Berger, 2016a, p. 7): it becomes almost impossible to think outside neo-liberalism's world view and, therefore, to think how things could be otherwise (Llewellyn, 2017).

Equally, but perhaps not recognised so clearly, an absence of any historical sense militates against seeing that the world could be different. We argue that it is part of the neo-liberal project to cut us adrift from our past and to de-historicise our lived experience of the present, generating a sense of 'historic loneliness' (Berger, 2016b, p. 17): '[a]ny sense of

history, linking past and future, has been marginalised if not eliminated' (p. 17). History's traces are unseen, ignored and forgotten (Passerini, 2000, p. 135):

Experience is being wiped out. The horizons of past and future are being blurred. We are being conditioned to live an endless and uncertain present, reduced to being citizens in a state of forgetfulness. (Berger, 2016c, pp. 139-140)

This silencing of the past contributes to making unthinkable a different future. Thus our interest in 'blowing the dust off history' (<http://on-the-record.org.uk/>). History can enable us to glimpse that current hegemonic common-sense is contingent and therefore fragile (Ball *et al.*, 2012, p. 514) and designed to serve the interests of some people and not of others. In other words, 'our understanding of the past has strategic, political and ethical consequences' (Hodgkin and Radstone, 2003, p. 1). It follows that our backward looks are not backward-looking but forward-looking (Povey and Adams, 2017, p. 808); our intention in our activist project is that our use of historical material is 'present-minded' (Samuel, 1980, p. 168).

A further feature of the radical history tradition (Samuel, 1980) on which we are drawing to inform our thinking emphasises the significance of the everyday to counter the cry of the performative regime that 'experience is nothing, productivity is everything' (Ball, 2013, p. 136). Radical history tries to capture 'the texture of daily life in the past' (Samuel, 1980, p. 172): '[r]evolutions are about little things. Little things happen to you all the time, everyday, wherever you go, all your life' (Rowbotham, 1969. np, quoted in Rowbotham, 2000). Our aphoristic data and research fragments reflect this everydayness and are intended to make a contribution to how we

construct ourselves for ourselves as researchers ... to seriously rethink our ways of being in the world as mathematics educators, and ... change our practices of thinking, asking, working, exploring, fearing, hoping, pondering, and so on. (Appelbaum, 2017, p. 277)

In the next section we elaborate further on the possible role of the aphorism.



The way I go is the way back to see the future. Jitka Hanzolá, photographer, quoted in Berger, 2016a, p. 135)



... it is not only animal and plant species which are being destroyed ... but set after set of our human priorities. The latter are systematically sprayed, not with pesticides, but with ethicides - agents that kill ethics and therefore any notion of history and justice.

Particularly targeted are those of our priorities which have evolved from the human need for sharing, bequeathing, consoling, mourning and hoping ... (Berger, 2016a, p. 83)

... if I put my hand on my heart I'd say [*Smile*] was a sort of idealistic failure in the end (group conversation, 2016)

IV Aphoristic fragments

We began using aphoristic fragments, bits and pieces, scraps, simply as an experimental way of working with our research material. Our project is an activist one and we are ourselves deeply involved with the "data", both through our personal histories and our current emotional engagement. Enchantment presented a way of thinking about how we might work with the material, a way which lies outside our habituated responses as researchers:

Approaching empirical materials in a mood of enchantment involves a self-consciously affective engagement rather than aspiring to the objective stance often associated with analysis ... it allows recognition of the excessive, the ebullient, the vivid and the felt. (Burnett and Merchant, 2016, p. 30)

The aphoristic fragments carried some such potency.

To understand the role of the aphoristic fragment better, we turned to the work of Gary Morson (2003), immediately drawn to the title: *The aphorism: fragments from the breakdown of reason*. A fragment is essentially incomplete. Morson contrasts aphorisms with dicta. Dicta see no mystery and come with the feeling that a dark epoch is over. Their rhetoric tends to totality (there is no sense of "on the whole and for the most part"), certainty and absolute clarity with an eschewal of metaphoric thinking. Dicta typically present their truths as axiomatic and are intolerant of exceptions, paradox and doubt. The dictum means what it says and demands to be heard. It is isolated from history and represents a conclusion (pp. 416-419).

In contrast, the aphorism is a beginning and speaks of the necessary incompleteness of our knowledge of what is most important. It does not say, it shows and gestures. It is marked by provisionality and is never finished (pp. 422-427). In their very brevity, aphorisms are capable of many interpretations (p. 412). Whether or not something is an aphorism is not to do with its essence; rather it is to do with how it is read. We try out reading something as an aphorism and 'see what happens' (p. 422); and '[t]o read a short expression as an aphorism is to read it as incompatible with the perspective of the dictum' (p. 411).

Where we depart from Morson is with respect to linking dicta with utopia (p. 418). We intend our use of history to be utopian,

not in the sense of a ready-made scheme projected onto the real world, but rather as a criticism of existing conditions springing from an intuition of changes potentially immanent in the present. (Passerini, 2000, p. 138)

Morson notes that aphorisms 'gesture beyond themselves' (p. 423); they point not towards a goal but to a horizon that continually recedes as we approach it. This seems to us to be a defining characteristic of utopia: 'we feel that even though we do not reach the goal, the quest is not futile because at each step we acquire greater wisdom' (p. 413). Ruth Potts (2017) quotes Fernando Birri:

Utopia is on the horizon. Every step I take towards her, she takes a step back and the horizon runs ten steps further away. So what purpose does Utopia serve? Well, it serves the purpose of making us move forward. (p. 16)

Neo-liberalism seeks not only to discipline the self but also to discipline our imaginations; against this, utopian imagining acts as a catalyst for change. The very provisionality and gesturing of the aphorism can serve to counter the myopia caused by neo-liberalism as it obscures the vision of alternative possible futures.

V Concluding remarks: a meeting place

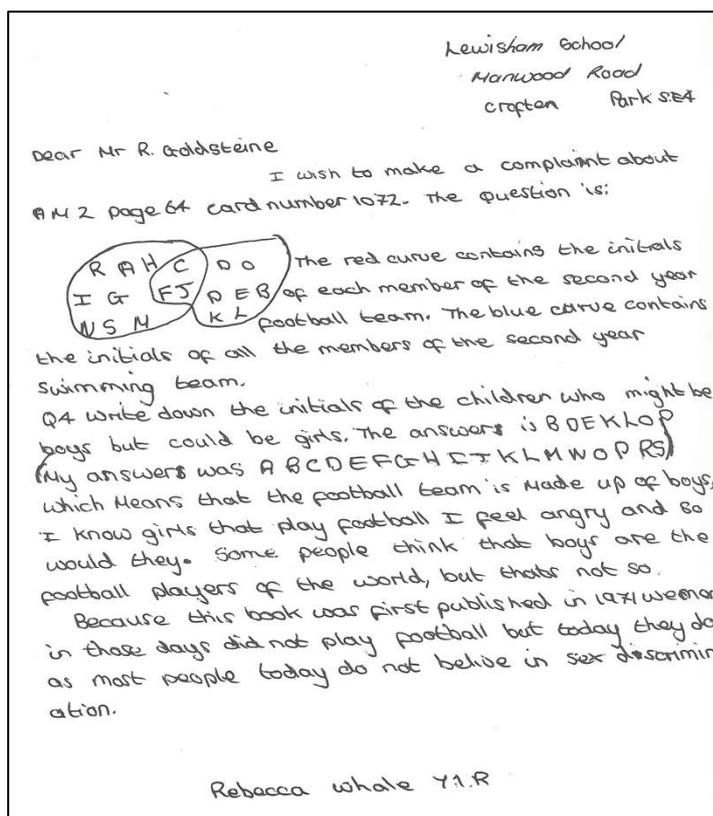
We have written above about 'historic loneliness' (Berger, 2016b, p. 17). In the same article, Berger has invoked in addition the metaphor of *no-fixed-abode* or *homelessness* to capture this isolation. Elsewhere he writes:

People everywhere - under very different conditions - are asking themselves - where are we? The question is historical not geographical. What are we living through? Where are we being taken? What have we lost? How to

... they have succeeded in burying and covering up the imaginative spaces ... (Berger, 2016a, p 83)

... the politics, the enthusiasm, the arguments, the craziness ... (group conversation, 2016)





Splash (Smile teachers' newsletter), June 1981

[On a recent visit to a school in Wiltshire] all the classes in the school ... had posters up at the back, and they had to be put in the back of the room – they were for the teachers, not for the children. The one that I liked best was *Are All Your Children Achieving Beyond Their Targets?* So they could see that every time they looked round. Is every child achieving beyond their targets? Where did this come from? Senior management. This doesn't make any sense, it's insane. If they're all achieving beyond their targets, the targets were wrong. This is madness, absolute madness. (group conversation, 2016)

continue without a plausible vision of the future? ... To the anguished question *Where are we?* the experts murmur: *Nowhere!* (2016a, p. 36)

As Anna Llewellyn points out, it is questions like this that 'allow us to examine how we are constituted and what we think we are' (2017, p. 157).

Our response has been to try to find a 'meeting place' (2016b, p. 17), a "somewhere", within which it might be possible to understand, interrogate and oppose dominant discourses. We have argued that the meaning we make of the past is also the meaning we make of the present and that such subjective and localised making of meaning can be agentic:

an understanding of subjective experience and everyday social relationships can be used to pose major questions in politics and theory, and to transform our understanding of some of the leading phenomena of our time. (Samuel, 1980, pp. 173-174)

However, reweaving the threads of significance between the past, present and future is a delicate and difficult task (Anderson, 2000, pp.13-14); and, we add, a *necessarily* disorderly one. We have written about our activist project more conventionally elsewhere (see above) and will continue to do so in an attempt to gain support for further action; but, if it is to make any difference, a 'genuine transformative passion' is required (Bewes, 2002, p.172) and to show this as researchers is to function not as we are supposed to do (Straehler-Pohl, Pias and Bohlmann, 2017, p. 13) but otherwise. Our tools are imperfect and inevitably format and deform but nevertheless they are worth employing: '[a]ll tools are defective, though not useless, so we must try many and see what results' (Morson, 2003, p. 421).

As noted previously, our activist project has generated a considerable volume of "data" and has led to the creation of a pilot website (<https://smilemaths.wordpress.com/>) which contains many of the fragments attached here: but as we have become concerned to situate our project better within a theoretical landscape we have, at a visceral level, experienced the "ordering" of our thoughts. Thus our attraction to attempting 'more *experimental and radical forms of presenting*' our research as invited for this special issue.

Acknowledgement

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