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Actor Network Theory, Agency and Racism: The Case of Sickle Cell Trait and US Athletics

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Abstract

Actor Network Theory (ANT), and its principal proponent Bruno Latour, have invigorated recent social theory. In assessing the agency of things they offer a fresh perspective on materiality and on the role of the nonhuman (animate and inanimate), and have challenged the central place of sociology in social research. One increasingly influential concept associated with ANT is that of 'assemblage'. The paper takes a contemporary concern - the sudden death of student athletes later found to be genetic carriers of sickle cell – and uses this to assess the concept. Whilst ANT, and the notion of assemblage, offer interesting avenues for research, the difficulty in sustaining a plausible notion of durable, structured social interests carries political consequences.

Keywords (max 6): Actor Network Theory, materiality, racism, sickle cell, social interests, sports.

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1. Introduction

Actor Network Theory (hereafter ANT) has attracted increasing attention over recent years. Associated, at least initially, with the work of Callon, Latour and Law, ANT has offered fresh perspectives on a wide range of topics (see, for example, Nimmo, 2011, Michael 2006, Thrift 1996) and has brought about a significant rethinking within the social sciences of the relations between the human and the nonhuman. In particular, Latour has emphasised the imbrication of humans with the material, organic world they inhabit, and has argued that the 'domain of the social' needs to be replaced by analyses which recognize the 'hybrid' nature of life, the inseparability of the social, the natural and the technological. ANT has therefore not only prompted a fresh interest in interdisciplinarity, but has also directed attention to the material dimensions of life, and to the role played by devices, artefacts, germs and disease.

ANT has not been the sole source of concern with the place of the nonhuman in social life: writers associated with the 'new materialism', such as Jane Bennett and Karen Barad, have also expounded a posthumanist approach, whilst yet others, such as Dant (2005), have argued for closer attention to the material but from a phenomenological perspective. Nevertheless, ANT is the most widely known of these approaches and has drawn the greatest critical attention. Winner (1993) for example, has queried the political implications of ANT, whilst Elam (1999), has pointed to ANT's indifference to questions of power, gender, culture and ideology. In this paper

we shall assess these reservations by considering how ANT might contribute to an analysis of sickle cell disease (SCD) and sickle cell trait (SCT).

Sickle cell disease is the collective name for a range of serious inherited chronic illnesses, the most common of which is sickle cell anemia, with the genotype denoted as HbSS, indicating that the person has inherited two copies of the gene encoding sickle hemoglobin, hemoglobin S (Serjeant and Serjeant, 2001). Genetic carriers (with their genotype denoted as HbAS, indicating the person has inherited one copy of the gene encoding sickle hemoglobin, and one encoding usual adult hemoglobin, HbA) have historically been referred to as "having" sickle cell trait. The example of SCD and SCT has many features that make it an ideal candidate for ANT analysis. SCD and SCT are genetic conditions: in scientific discourse sickle cell genes are spoken of as if part of the nonhuman world of things. As these genetic conditions refer both to genes and to their embodiment within specific human organisms they might plausibly be regarded as hybrid phenomena in which the human and the nonhuman are inextricably mixed. SCD and SCT are thus simultaneously natural, social, and discursive: what Latour terms an 'assemblage'.

Latour's notion of an assemblage refers to a heterogeneous bringing together of multiple interrelations of the human and the nonhuman into a relatively coherent and stable entity, in this case 'sickle cell'. An assemblage is a product of associational networks, connections any entity is able to hook into: the greater the number of connections, the greater the mobility and the more 'real' an entity becomes. SCD and SCT may be seen as examples of such entities, for both have become key elements in a range of scientific, medical and political networks (Carter and Dyson 2011). Thus,

sickle cell is enrolled as a *natural* category by scientists identifying it as an exemplar of natural selection (Allison, 1954) because SCT, but not SCD, protects against malaria in early childhood, but as a *social* category by the Black Panthers who saw it as part of the social sickness of racism, poverty and lack of medical services for African-Americans (Nelson, 2011). At various times sickle cell has also been enrolled as part of *discursive* networks allocating 'African identities', for example where possession of the sickle cell gene compromises a person's claim to whiteness(Tapper, 1999).

SCT and SCD might also be seen as examples of how 'things strike back' (Latour 2000), and exert influence within the networks to which they are connected. Sickle cell, as a number of writers have demonstrated (see Tapper, 1999; Carter and Dyson 2011) has become an 'ethnicized disease' with a range of policy, medical and political consequences. In particular the presumed association of sickle cell with "black" populations has meant that, at least in the USA (Hill, 1994) and the UK (Anionwu and Atkin, 2001), the study of sickle cell has been closely associated with the study of racism. The denseness of this association, it might be argued, is brought about by SCD being both a *claimed association* by black community groups campaigning for services (Tapper, 1999, Nelson, 2011) *and* an *imposed association* by virtue of the use of sickle cell as a key resource for those wishing to discriminate (Dyson and Boswell, 2009).

Recent developments have made the case of SCD and SCT yet more appropriate for assessing the claims of ANT. In the USA, SCT has been associated with the unexpected deaths of a small number of college athletes. Hitherto, SCT had been

represented in public health education material as benign. Following the deaths of athletes with SCT, it could be suggested that the single sickle cell gene has real clinical effects of its own (and not necessarily only in conjunction with its enabling genetic partner) and is ostensibly 'refusing' to remain benign. Moreover, attributing fatalities to SCT has disturbed other parts of the assemblage, by disorientating sickle cell communities of interest whose political lobbying has been based around the claim that SCT, as a harmless carrier state, should be distinguished from SCD, and the suspicion that discrimination occurs precisely because this distinction is not made.

Finally, and as we shall consider below, ANT has been a key influence in the development of the 'new materialism'. One aspect of ANT that makes it particularly appealing as an approach to considering sickle cell is its emphasis on *matter*, and its insistence that things, such as the sickle cell gene, have agency through their capacity to shape the assemblages to which they are connected. For example, the mishandled introduction of sickle cell screening in the USA in the 1970s (Duster, 2003), confused SCD and SCT, conflating people with a disease and those who are genetic carriers. Subsequent screening programmes have therefore emphasised a strong distinction between SCD and SCT, referring to those with SCT as "healthy carriers" (Jordan el al, 2011: S406). Parents of children identified as sickle cell carriers, that is, infants with SCT identified as a by-product of screening of newborn children for SCD, are reassured that their children do not have an illness. However, those working with sickle cell voluntary groups will know well that those with SCT will occasionally complain of symptoms they attribute to the trait, (Fulwilley, 2011). Here, it could be claimed, is an example of the agency of the sickle cell gene, exerting an effect which, according to most public health advice, it is not 'supposed' to.

The second part of the paper introduces Latour's version of ANT in more detail and suggests that it provides important insights into the analysis of SCT and SCD, and the apparent SCT related deaths of college athletes in the US. The third part examines the empirical case of putative SCT-related sudden deaths among US college athletes and military recruits. The conclusion considers the usefulness of an ANT approach more generally in the light of this example.

2. Agency, action and ANT

ANT developed from the field of STS (Science and Technology Studies) and its study of technological and scientific practices, most notably in Latour and Woolgar's study of *Laboratory Life* (1986). A number of the ideas developed in this text found their way into ANT, particularly the notion that scientific knowledge owed much to the networks of scientists and their inscription and measuring devices. The effect of this latter claim was 'to demonstrate that there is nothing epistemologically special about the nature of scientific knowledge' (Dant 2005: 76) and to suggest that the agency of inscription and measuring devices was as significant in a network of actors as that of the human participants. Latour and Woolgar's central point was that the distinction between the social and scientific realms was untenable because the scientific realm is merely the end result of many other processes that are in the social realm. Consequently,

> [W]hether a given statement is objective or subjective cannot be determined outside the context of laboratory work. This work is precisely intended to

> construct an object which can be said to exist beyond any subjectivity. As Bachelard (1934) put it "science is not objective, it is projective".
> (Latour and Woolgar 1986: 90)

ANT proper extended these insights to attribute a key role to material objects. Central to this move is the extension of the notion of agency, to include both things as well as humans. In ANT, any distinctions between action and agency are beside the point: agency is the 'power to do' and for Latour everything has agency, that is, the ability, when assembled into a network, of influencing the character of that network. Thus Latour, in his defence of Gabriel Tarde and his vitalist monadism, insists that 'The agencies to deal with, the ones we really have to consider if we wish to explain something, are neither human agents nor social structures, but the monads themselves in their efforts to constitute unstable aggregates, what we would call actants' (Latour 2002:127). This vitalism views the world as a ceaseless struggle between actants (human and nonhuman) to achieve stable networks, some of which become relatively permanent, others of which are fleeting or evanescent. Actants are human and nonhuman actors whose precise figuration has yet to be determined because their relations within a network are not yet defined. Action is thus not consequent upon intentionality and so not confined to the human; any thing that modifies a state of affairs by making a difference is an actor. In this way, the 'variegated lives materials have to offer', as Latour (2007:112) puts it, 'can be brought out of the shadows.' For Latour, then, the capacity to act, the power to make a difference, is found in all things, although its exercise is realised only through a network: action is always action upon other things and is therefore relational.

The view of action as the measure of agency is consistent with the emphasis on the performative in ANT. Associations and networks are stabilised to various degrees by how they do what they do; indeed, 'For the sociologists of associations, the rule is performance and what has to be explained, the troubling exceptions, are any type of stability over the long term and on a larger scale' (Latour 2007:35). The world of networks and associations is a dynamic one, its dense webs of relations temporarily stabilising here, already dissolving and rearranging somewhere else: 'the object of a performative definition vanishes when it is no longer performed - or if it stays, then it means that other actors have taken over the relay' (Latour 2007:36). Reality is a process of constant morphing, as entities become more or less real, shifting in and out of ontological focus as they accumulate or shed associations and move between networks.

This perpetual motion is facilitated by what Latour terms 'chains of translation'. These are the network connections ('chains') which enable entities to move swiftly between different networks, allowing them to convert ('translate') the interests of others into their own projects. Latour describes this process of translating and enlisting other interests as a technological project. It is worth considering the process in more detail as we view it as a potentially fruitful approach to the politics of sickle cell.

Latour argues that what counts in a technological project is 'deciding what has to be negotiated, and deciding on an official doctrine that will make it possible to proceed with any negotiation at all' (Latour 1996:112). In the case of sickle cell, this means deciding what sickle cell is exactly: a genetic condition, a political project, a product

of racism, some combination of all of these? The initial idea for the project will, in the terms outlined above, be ‘unreal’ and ineffective; the purpose of a project is to make the idea more real and less ineffective. To do this, an idea must translate the interests of other actants, must begin to deepen its network of associations. This occurs when actants translate their interests into those of other groups using the key ideas of the project.

Thus it is that ‘Only after these many recruitments, displacements and transformations does the idea become real, manifesting the characteristics of, say, coherence, effectiveness, completeness that are mistakenly attributed to it at the outset in other accounts’ (Latour 1996: 119). In the case of sickle cell, what begins as a genetic condition confined to populations with a specific geographical distribution becomes part of the African-American struggle against discrimination. A key factor in translation in this case is the alliance between science and progress. Sickle cell communities of interest forge alliances with political lobbyists, academics and medical practitioners on the basis that they have science on their side. This is why the deaths of a small number of black athletes with SCT (the one gene condition) is a powerful threat to those ‘technological projects’ concerned with establishing SCD as a condition concordant with the broader struggles of African-American civil rights (Tapper, 1999). Maintaining this ‘strong’ distinction between the ‘harmful’ SCD and the ‘harmless’ SCT is necessary to such technological projects in order to avoid discrimination against substantial numbers of black people with SCT.

In brief, ANT offers a dynamic account of networks and interests that regards reality as performative, provisional and projective and agency as a capacity of all things

capable of being associated with other things. This suggests that it might be well suited to providing an account of SCD and SCT and their emergence as a political assemblage.

3. SCT and Unexpected Death in Athletics, Military Training and Criminal Justice

As we have seen, a key focus of the anti-racist political projects in the 1970s in the US was combatting the discriminatory practices around the alleged dangers of SCT (Duster, 2003). The anti-racist case was built around the sharp distinction subsequently drawn between the serious chronic illness SCD and the harmless carrier status SCT (see Konotey-Ahulu, 1996: 349-371, for a strong version of this separation). However, a challenge to this core distinction arose following the publication of a study of sudden deaths from exertional heat illness in military recruits (Kark et al, 1987). The authors found an increased risk of unexpected death in training for those with SCT. Attempts to restrict recruitment to the armed forces of those identified as SCT carriers were successfully challenged as discriminatory. Instead, the US forces debarred those with "non-treatable anemia" meaning that those with SCT (who do not exhibit anemia) would be passed fit for service but those with SCD would be excluded (Grant et al, 2011).

However, the distinction has received a more recent challenge. Since 2000, around one athlete a year in the USA has died in training and been recorded at autopsy as having sickled cells. These deaths have attracted popular scrutiny precisely because they appear to challenge the view of SCT as a harmless carrier state. Sports science articles have argued for and against SCT as a risk in exercise (Le Gallais et al, 2007).

Magazine articles have taken up the issue in more sensationalist ways, describing SCT as the “monster within” (NCAA, 2011) and “college football's serial murderer” (Bautista, 2010)..

The significance of these claims may not be readily apparent if the role of men’s college football and its financial muscle within US universities is not acknowledged. Clotfelter (2011) notes that “big-time” college sports (principally men’s football and basketball) are professional in all but name. The student-athletes within these sports aspire to move from poor backgrounds to professional sports-star wealth, though their chances of ghetto-to-riches social mobility have been cited as around seven in a million (Dunning, 1999). The sports are associated with lucrative TV coverage and extensive commercial sponsorships and endorsements, what Jhally (1984) termed the sports/media complex. Sports coaches are often the highest paid staff within universities and within the public sector overall (Clotfelter, 2011). However, except for college scholarships, the players are unpaid. This unpaid status is rigorously policed by the National Collegiate Athletic Association (NCAA). The occurrence of sudden deaths of student athletes in training potentially calls into question methods of sports coaches, and at least one of the deaths has involved a large financial settlement (Jordan et al, 2011). For financial, legal and reputational reasons, the NCAA moved to police the status of sickle cell, specifically how SCT was to be regarded.

The tensions between those claiming SCT to be harmless (principally those concerned with anti-discriminatory political aims) and those who wished to reinstate it as a marker of difference between African-American athletes and all others were plain to

see in 2008. A leading proponent of the NCAA 'monster within' view gave evidence in the trial of eight boot-camp guards caught on video assaulting a 14 year old boy for discontinuing an exercise punishment consisting of laps of the detention compound. The boy died, and the first medical examiner attributed death to SCT. However, a second autopsy attributed the death to asphyxia resulting from several ammonia capsules being forced up the boy's nose whilst a hand was held over his mouth. The misuse of ammonia capsules in this way had become routine practice at the boot camp as a punishment given to young offenders for failing to co-operate with the enforced exercise regimes. Despite this, at the murder trial, Professor E. Randy Eichner, a sports scientist at Oklahoma University successfully persuaded the (all-white) jury that the finding of the second autopsy was implausible since the use of ammonia capsules was widespread within US sports (Dyson and Boswell, 2009).

In 2009 the National Association of Trainers of Athletics issued a statement on the alleged dangers of SCT with respect to unexpected death during exercise. The NATA meeting included only two sickle cell experts (out of 20 participants), and the NATA styled the statement a "consensus", despite its being by endorsed by only some of the organizations represented. Nevertheless in 2011 the NCAA mandated the use of screening (but not counselling) for athletes attending universities/colleges in Divisions I and II of the NCAA structure, extending this to Division III athletes in 2013, despite opposition in 2012 from the American Society of Hematology (2014) . The NCCA and its lobbyists were building an assemblage whose effects on other, rival networks were becoming more 'real'. For instance, sickle cell communities of interest such as sickle cell doctors and the Sickle Cell Disease Association of America

(SCDAA) found themselves confronting a new constellation of concerns brought about by the changed definition of SCD and SCT. Three effects in particular were prominent.

First, there was the reinsertion into public debate of the notion that SCT is a disease. In the USA the number of people with SCT is forty times greater than those with SCD; confusing the distinction between the two enables discriminatory procedures to be extended to a much larger number.

Secondly, this confusion was specifically associated with discrimination in entry to the armed forces (Duster, 2003), in insurance (Bowman, 1977), and in employment (Draper, 1991). Discriminating against someone who is a sickle cell carrier effectively discriminates against African-Americans, but does so in an ostensibly colour-blind manner. Furthermore, the discrimination is difficult to resist because it appeals to objective scientific 'evidence', a powerful factor in assembling networks impassive to discriminatory outcomes. Belonging to a group characterized as being at higher risk of possessing SCT becomes a mechanism through which discrimination can be simultaneously effected and denied.

Thirdly, the sickle cell gene came to be seen as a key marker of blackness, even for someone whose somatic features were 'white' (Tapper, 1999), partly because of misrepresentations of sickle cell as both exclusively and primordially African (see Carter and Dyson, 2011 for a critique). This was a powerful connector, enabling SCT to be hooked into a range of other networks or assemblages: those seeing the demonization of SCT as a measure of the extent to which racism affected public

health policies towards African-Americans, but also those who implicitly regarded SCT as indexing a genetically flawed 'black body'. This last, in particular, generated a good deal of 'network traction'. Eichner's testimony drew part of its strength precisely from its location in this network. It also acted as a powerful translator between this and other networks, especially the emerging one between the NCAA and the National Association of Medical Examiners (NAME). NAME had already indicated its support for the view that the presence of SCT at autopsy could legitimately be used to explain a number of unexpected deaths of African-American men in contact with officers of the state (Dyson and Boswell, 2009).

This process - of heterogeneous elements contingently combining to form a relatively stable, yet dynamic, entity whose effects are greater than the sum of its parts – can be usefully captured with Latour's notion of an assemblage. In the case of SCT and SCD, the assemblage promoting a 'weak' distinction between SCD and SCT quickly became 'more real' than rival networks, accreting other actors and extending its range through 'chains of translation'. Callon (1986: 59) refers to 'an obligatory passage point', a central referential feature of a network that compels others to take note of it. The 'passage point' was reached when the NCAA made SCT testing mandatory. This enrolment of a technical device simultaneously established the disinterested nature of the assemblage and the apparently objective nature of the problem the assemblage was directed towards resolving.

In order to justify their stance on mandatory testing, the NCAA relied on a series of case reports of deaths of athletes , cases where sickled cells (red blood cells that have deformed into rigid crescent-shaped cells rather than the rounded shape of usual red

blood cells) were found at autopsy. However, sickled cells at autopsy by themselves cannot implicate the role of SCT in a death, since sickled cells are an artefact of death in someone with SCT (Bowman, 1977; Konotey-Ahulu, 1996; Mason et al, 2008). Doctors routinely include SCT as a description on death certificates when the SCT had no role in the death (Mason et al, 2008), thereby buttressing the weak distinction between SCD and SCT and amplifying the extent to which SCT is regarded as potentially dangerous. Nevertheless, these reports were assembled by the NCAA and in a context already shaped by the growing force of the 'SCT is a problem of black bodies' assemblage. Moreover, the case reports often cite other reasons for the deaths; the sense of a "series" in NCAA case reports can only be achieved by editing out other reasons stated at autopsy and foregrounding the mention of SCT. 'Death due to SCT' is assembled.

The ANT emphasis on assemblage has much to offer the study of the case of unexpected death and the US athlete. Latour's approach draws attention to the ways in which 'truth' is assembled and made compelling, or 'stabilised', to the extent that the interests of actors can be rendered congruent in a network. Assemblages, and the 'truths' they seek to sustain, are thus provisional and potentially pull in different directions. In the case studied here, the imposition by federal and state authorities in the US of poorly conceived screening and comprehensive sickle cell centres in the early 1970s (Duster, 2003) prompted a response by black community activists, sympathetic medical professionals and liberal policy makers (see Tapper, 1999). This assemblage stabilized around a strong distinction between SCD as a chronic illness and SCT as a harmless carrier state. Once this distinction was 'made real', medical screening was able to proceed: the large section of the African-American community

represented by people with SCT (about 1-in-12) was relatively more insulated against social discrimination, and successful challenges to such discrimination, for example in access to the armed forces (Bowman, 1977), were possible.

However, subsequently the unexpected deaths of military recruits and student athletes were successfully enrolled to destabilize this working consensus and prepare the way for a new network reinforcing views of SCT as a genetic flaw and sickle cell carriers as a liability. In part the success of this new network can be attributed to the sickle cell and its indifference to medical accounts of its behaviour, what we might term its recalcitrant materiality.

The advantages of emphasising the materiality of SCT are clear in Latour's conception of experimental design. Pawson and Tilley (1997) suggest that in effective experiments researchers know the outcome they expect and create the conditions to produce this outcome, thereby confirming that their conceptual understanding of the causal mechanisms at work is strong. Latour (2000) takes this further in proposing that what characterises a strong experimental design is not control, but rather that the experimenter produces conditions under which the factor is accorded maximum freedom from context, the freedom to "strike back".

A series of controlled studies by Kark et al (2008) into recruits in training created precisely these strong experimental conditions. Kark had originally found raised relative risk of sudden death among military recruits with SCT due to exertional heat illness during training (Kark et al, 1987). Kark then conducted a prospective controlled study in which a number of military centres complied with precautionary

measures for all recruits. These precautions included avoiding exercise in adverse conditions, building up conditioning gradually, auditing of hydration taken by the recruits, avoiding exercise after illness and other measures. The precautions entirely removed any risk of death from exertional heat illness on the part of all recruits, including those with SCT (Kark et al, 2008). In other words, precautions important for *all* athletes completely eliminate any possible risk for athletes *with SCT*; the role of SCT becomes one of intensifying the progress of exertional heat illness once it has begun, not initiating it through sickling. Enforced screening without counselling (with consequences of increased discrimination) is not necessary. Instead precautions for all athletes prevent a pool of those with exertional heat illness developing in the first place. Prevention has been possible without resort to screening. In successfully preventing *all* recruits engaged in exercise from developing exertional heat illness it prevents those with SCT from entering this pool of risk, and thus prevents *all* unexpected death during exercise, including preventing *all* such deaths in which the person has SCT. Kark's arrangements permit the sickle cell gene freedom from the culture of US sports coaches to exercise unpaid sports workers in a reckless manner liable to induce exertional heat illness. Where it is accorded this freedom SCT remains benign.

5. The Limits of an Assemblage Approach

An ANT approach has much to offer an account of the ways in which a particular truth about SCT comes to be assembled and established. ANT carries an obvious plus for political practice in its emphasis on objects as networked entities, as dynamic rather than fixed and therefore as potentially liable to change. This invites political

judgements about the stability or otherwise of a state of affairs, about the likelihood of establishing a 'matter of concern' or of bringing about the connections and translations necessary for new networks and assemblages to be established.

However, making such judgements effective requires a notion of interests. This is not merely a question of which groups are relevant to which networks but which groups have the resources to enter the game and to define its terms. As we have seen in the case of SCT and the student athlete, the NCAA, the coaches in big-time college sports, the complex of sports-financial interests (including rich business executives who can earn tax breaks for funding "universities" whilst actually funding college sports and hence their own leisure activities) effectively have vested interests in expropriating the unpaid labour of student athletes, and in defensive actions against being sued by those athletes. The student athletes, and more broadly the sickle cell communities of interest (people living with SCD, their families and local support groups) have little voice in the matter even though they are intimately affected by the consequences. There are interest groups who are excluded from networks, in this case the numerous possible interests, including medical associations, who were not part of the NATA "Consensus" statement in 2007 that initiated the move to screen student athletes (Dyson and Boswell, 2009: 21-24).

In addition to the empirical questions of which groups and interests are able to successfully network and assemble, there is also the question of the broader origins and unintended consequences of social choices. We have noted above how remote is the possibility of moving from urban poverty to a lucrative professional sports career (Dunning, 1999). However, in conjunction with the availability of racist ideational

resources, such as notions that the black athlete is genetically well endowed, possibly as a consequence of genetic hardiness engendered through slavery survival (Hoberman, 1997), the lure may prove attractive to athletes from low income backgrounds. Moreover, an unintended consequence of framing SCT as dangerous is that it provides an ostensibly compelling ideational resource with which to explain away deaths of black men whilst in state custody (Dyson and Boswell, 2009).

Finally, there are potential choices that never surface as matters of concern within networks. The SCT and student-athlete debate does not problematize the wage labour exploitation of student-athletes for profit. It does not debate the racialised nature of poverty in the USA, a poverty that helps make available as unpaid labour African-American athletes. It does not consider the genesis of the gross inequities in school education, and hence, again, the procurement of athletes from low-income households to whom an athletics scholarship is a pre-requisite for a university place. There is little focus on the methods and culture of the coaches of university big-time sports teams. Finally, we are less liable to refocus on the real unmet needs of those living with SCD: the 80,000 in the USA who struggle to find a provider of health services (Sobota et al, 2011) or the 300,000 born annually worldwide with SCD who could benefit from newborn screening to save their lives (Dennis-Antwi et al, 2011).

This relative neglect of structured social interests we would suggest is a product of Latour's concern to avoid dualist thinking (see Turner, 2012). In response to the conflation of SCD and SCT in policy in the 1970s the medical professionals within the SCDAA sought various forms of what Latour would call modernist purification: that whilst SCD was dangerous to health, SCT was harmless. By contrast the NATA

and the NCAA have worked with a hybrid: the African-American SCT student athlete (hereafter SCT athlete). The principle that categories are never entirely social or natural, but always hybrids, is applied with force in the form of the SCT-athlete.

The work of the NATA and NCAA in building longer and longer networks around the SCT-athlete hybrid is in effect recasting, but deepening, the alleged differences between blacks and whites, because the "idealization of sport as an autonomous site for innocent play amplifies the normative reification of race" (St Louis, 2003: 91) Carrington (2011: 90) notes that "sport is seen at one and the same time to confirm the arrival of a post-racial settlement and to offer self-evidential proof of the existence and undeniability of the facts of racial difference" and that in this respect the sports/media complex has a deeply embedded normative whiteness, whose structures "remain overwhelmingly white and male" (94). Thus what distinguishes the white sports/media financial complex and the black wage labour it largely rests upon is no longer skin colour, because in the locker room African-American student athletes are sports equals. However, the white sports-financial complex is highly adroit at identifying and exploiting the network traction of the SCT-athlete hybrid. It does this partly through deftly censoring information, in sports channels and magazines for whom, as we have seen, the SCT-athlete becomes a form of sensationalist revelation. The revelations are tales crafted to interpellate their readers: to position them not merely in relation to the tale (at risk from SCT or not) but to surrender their own critical judgments about sports policy or indeed wider social policy. This limiting of resources for the mobilisation of rival networks is often carried out by sports science researchers who bring into view only selected details, ignoring cases where other plausible causes of death are in evidence (heart problems, viral meningitis and in one

instance, a case where the person who died actually had a form of SCD not SCT, Graham, 2006); leaving out cases where screening and identification clearly did not work as a precaution (Friend, 1994; *USA Today*, 2013); ignoring other far more common causes of unexpected athlete death, some linked to commodities such as alcohol promoted both within sports culture binge drinking and by the vested interests of sports advertisers; ignoring unintended negative consequences of framing SCT as a purported danger to health (Konotey-Ahulu, 2011) or indeed actively amplifying the negative consequences (Dyson and Boswell, 2009).

The sports scientists linked to the (white) sports-financial complex are prepared to actively encourage the SCT-athlete hybrid, confident in their ability to manipulate the outcomes in a way that serves their social interests (for example, consultancy for elite sports, Spracklen, 2008). These interests, we suggest, are against the unpaid student athletes, against the poverty and educational disadvantage of African-Americans more generally, against the interests of those with either SCT or those with SCD, and in favour of a white, rich, sport-business elite, especially in the US South.

7. Conclusion

In this paper we have assessed the strengths and weaknesses of ANT through an examination of the case of SCT and the student athlete in the US. In doing so we acknowledge a number of important insights that ANT brings to analysis. ANT reminds us that scientific "facts" are in part a product of particular assemblages of human and nonhuman actors. The assemblage that built the strong distinction between

SCD as a disease and SCT as a harmless genetic carrier state emerged from the efforts of black community activists, medical scientists and liberal policy makers. But assemblages are inherently unstable and changeable. A rival NCAA sports-financial assemblage enrolled the small numbers of deaths of student athletes who were found to have SCT at autopsy. This recognition of the materiality of things (in particular the effects of the genetic carrier state SCT) is a further strength of ANT. ANT also permits us to recognize that the white sport-financial complex has been, to a degree, politically *successful*. This assemblage has established a defense against expensive litigation by families of resource-poor black student athletes through the creation of an obligatory passage point, and has problematized SCT for student athletes, inscribed through the current policy of mandatory testing (or waiving of rights) for SCT in US student athletics.

However, ANT is less helpful in explaining the *political* success of some assemblages rather than others. The white financial sports-complex (of which the NCAA is merely a part) has substantially more resources than sickle cell communities of interest to frame what counts as an issue of concern (say, adequate adult care for those with SCD in the US, , or newborn screening globally,), leaving the latter with little voice: in Latourian terms, its associational potential is severely restricted and with it, therefore, the ability to generate alternative 'truths' about SCT. The broader contexts of technical choices, such as the systemic racism and poverty facing many African-Americans, and the unintended consequences of such technical choices, such as buttressing racist ideational resources used in the sphere of criminal justice, and reinvigorating discriminatory practices, are also less readily incorporated into an ANT perspective.

The shortcomings of an ANT/assemblage approach rest primarily in its unconvincing treatment of structured social relations (see Elder-Vass 2008). Whilst recognizing the significant possibilities for the inclusion of the nonhuman that it allows for, and the attention that it draws to the importance of detailed empirical investigation, this comes with a double cost: a view of agency that does not distinguish sufficiently between its human and nonhuman forms and, a corollary of this view of agency, an insubstantial view of social structure.

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