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Long live dangerous thinking: or, becoming infected by the '*thinginess*' of the social

'There is a direct relationship between the greatness of an author and the danger of the material he handles. It is not the task of a writer to be harmless. Harmlessness only begets harmlessness, but danger gives rise to imaginative thought (...). A good writer is infected by the material he works with - there is no way around this. Thomas Mann did this, Franz Kafka, Robert Musil ... all the great writers of this century. They were all masters of dangerous thinking.' (Peter Sloterdijk, *Selbstversuch*, 1996: 121; my translation)

Gerard Verschoor

Multiform. Diversified. Inimitable. If a single word could capture the wide range of work published by Norman Long, then surely these terms would be serious contenders. For these words stand for what is probably the most central concern of his oeuvre: understanding how what he calls *heterogeneity* comes about. After over two decades at his side - both as student and colleague - it is hardly a surprise to find myself sharing this central interest with him. But we disagree on the terms in which to study diversity. Thus in this chapter I argue that Long's actor-oriented approach has misunderstood heterogeneity (that what holds the social together) for diversity (the outcome of bringing dissimilar and hitherto unrelated elements together). To make my point, I first outline the character of our disagreement and propose that this be so because, for the last decade, Long has not risked becoming *infected* by the flesh-and-blood actors who fill his books. I then go on to propose - by way of three short cases - that in becoming infected by what we work with, we can indeed say original and exiting things about variation and diversity. I close the chapter by suggesting that there is much to learn from the people we work with, as it is they who can eventually allow us to say 'dangerous' things about the object of sociology.

An epistemological disagreement and a proposal

Our world is a disordered place. It harbours a bewildering array of dissimilar elements running from the smallest molecule to the largest living organisms. Through the ages we have learned to group these elements together so as to bring about some sense of order in our universe. The Sciences have been crucial in this

quest for classification. They have done so by associating hitherto unconnected elements with one another, carving out *societies* from chaos. Thus we have societies of living and non-living organisms (as in ecology), societies of forces (as in physics), societies of stars and solar systems (as in astronomy). Heterogeneity, or that 'composed of unrelated or differing parts or elements' (Collins English Dictionary), then, is the stuff from which the Sciences are made up. But there is one exception to this: the human sciences. As the name already discloses, these sciences effectively cross-out the different classes of elements with which humans may have an affair, and make one species - Man - the centre of the universe. In so far as other elements are allowed into the picture, these do so only as repositories of human meaning, or as means to achieve desired ends.

This form of discrimination has been under fire for some 20 years now in the field of 'Science and Technology Studies' (henceforth STS). The message from STS - namely that one cannot understand Man without taking into account how he becomes entangled with the objects that surround him - has given rise to such lively debates lately that one of its main proponents, the French anthropologist Bruno Latour, has occupied the top position in the social science citation index for the last four years. Some of the ideas from STS have already been taken on board in Rural Sociology - witness the mushrooming of actor-network theory studies in this field - but, so far, the impact has not been felt in our own field of Development Sociology. Considering these events, we can do two things now. We can wait and see how the field develops (to find out, eventually, that others have overtaken us) or run the risk of saying something dangerous (an approach that rather becomes Wageningen Sociology). Protagonists of the latter would claim that the object of Development Sociology consists of the complex entanglements of people and things: in other words, the study of the *hetero-genus* or of that, which, according to Webster's Collegiate Dictionary, 'consists of dissimilar or diverse ingredients or constituents.'

Reclaiming dangerous thinking

Science can be classified as being 'good' or 'bad' according to a set of agreed-upon criteria. These criteria (which are always normative) come in different forms, the best known of which are Karl Popper's (e.g. 1961). Of late other, non-Popperian criteria for 'good' or 'bad' science have been elaborated by the likes of Isabelle Stengers (1997), Michel Serres (1997), Donna Haraway (1989), Peter Sloterdijk (1996) or Bruno Latour (1993). The differences between the criteria are many, but for the purposes of this chapter I highlight the issue of just *who* is allowed to speak when we 'do' science. For Popper, it is clear that the scientist is in command, as the scientist 'still possesses the formidable privilege of raising the questions on his or her own terms' (Latour, 1999b: 7). From Popper's point of view, the theories of scientists may be falsifiable, but scientists nevertheless control the process of scientific investigation. Non-Popperian criteria for 'good' science, on the contrary, propose that scientists have to put themselves at risk by having the questions they are raising requalified by the entities put to the test (*ibid.*: 7). In other words, the issue is not one of designing questions that are most able to jeopardise a theory, but to ask oneself: 'Am I asking you the right questions? Am I sensitive to your resistance to my questions? Am I allowing you

to infect me?' In this essay I follow this non-Popperian criterion: science is 'good' when it does not 'silence' its object. More positively, it is 'good' when it accepts the risk of providing its objects a *voice* so that these acquire an important say in the definition of what is problematic and what is not.

Long and good science

Norman Long has in the past produced various pieces of 'good' science that conform to this non-Popperian criterion. An example of this dates back to the mid-1970s, when he launched the exiting idea that, in the case of Central Sierra of Peru, capitalist expansion produced substantial growth in the non-enclave sector. This growth was accompanied, he suggested, by patterns of socio-economic diversification and accumulation, especially in village-based trade and transport (Long, 1975; Long and Roberts, 1978; 1984). In addition, and contrary to views that claimed that the right tools to study these processes consisted of 'macro' concepts (such as those of institutions, organisations or nations), Long proposed that interactional networks and normative frameworks were the most appropriate instruments to gain insight into the dynamics of development (Long, 1972; 1979).

What is important in the context of my argument is that Long was able to say these things *because* he had overcome the recalcitrance of the people he interacted with *by learning to ask the right questions*. This is an extraordinary feat for, in the social sciences, it is quite usual for a scientist to ask questions, flee to the safety of the academic setting, invent a story, and get away with it without the object objecting. But Long chose to give 'voice' to those he studied: it was the actors *themselves* who allowed him to posit the dangerous and provocative claim that underdevelopment does not follow automatically from capitalist development. Little by little, and through painstaking anthropological fieldwork, Long achieved some degree of familiarity with the people he studied, and in doing so came to see the utter implausibility of stories that were being imagined, far away, from the comfort of Western academic settings. Like music and drug lovers who are 'under the influence ' (cf. Gomart and Hennion, 1999) Long let 'external forces' take possession of him. Thus 'infected' by his object, he was finally 'forced' to modify his account of entrepreneurs and 'authorised' by them to forward the interesting, original but also 'dangerous' thesis that one does not move an inch in understanding the behaviour of entrepreneurs by sticking to 'grand theories' that are out of touch with empirical reality.

Dangerous propositions kept on coming in Long's early Wageningen years. The ground breaking work on intervention situations culminating in the notion of *interface* (Long, 1989), for example, surpasses the non-Popperian criteria for good science outlined above hands down. But the times they are a-changin', as good old Dylan once put it. What was once daring may now be in dire need of overhauling. As Kuhn (1962) so convincingly showed 40 years ago, complex ideas snatch older ones, feed on them and eventually displace them to the garbage dump of history. Long's ideas – as brilliant as they were 20 years ago - have lost much of their appeal as they become re-framed by a new generation of development sociologists sensitive to the conceptual evolution and paradigmatic shifts of an increasingly fragmented field of study. Indeed, Lyotardian postmodernism, Deleuzian poststructuralism, Lacanian psychoanalysis and Latourian actor-networks have fused with world-systems analysis, regulationist

studies, globalisation theories, political ecology, and postdevelopmentalism (Buttel 2001) and have changed forever the way in which one is 'authorised' to speak about the world, the Other, or oneself.

These theoretical developments of course did not leave Long unaffected, and in fact provided the backdrop to a search for a more secure foundation for his explanations. Unfortunately, this move pushed him away from the field and into theory. As I have argued elsewhere (Verschoor, 1997), in doing so, Long chose to marry his original and fertile method with an eclectic array of ideas involving liberal and individualistic notions of *agency* à la Giddens (e.g. Long, 1992) and post-structuralist conceptualisations of *knowledge* and *power*. Embedding these three concepts in a model of strategic action that assumes humans to be selfish, rational, calculative beings who anticipate others' moves in order to pursue their advantage in conditions of scarcity (cf. Steins, 1999) led, throughout the mid 1990s, to a double impasse. Firstly, the object of study was relocated from *action* to processes going on *inside people's heads* (such as shared values and meanings). The character of the problem this involves is perhaps best illustrated by the pop musician Matt Johnson (The The): 'How can anybody know me, if I can't even know myself...' Secondly, the *actor* in the actor-oriented approach was no longer the flesh-and-blood actor who had authorised Long to say interesting things about him: he had become a *model of the actor*. In other words, Long's approach uses a discourse of 'actor-orientation' to bring a theoretical model of human behaviour into circulation - and not anymore to give 'voice' to real-life actors who are thus in effect 'silenced'. This, in my view, is a pity because of the potential of Long's unique ethnographic approach, which could (very easily and hands down!) become dangerous once more, by articulating for example with the ideas from the field of STS. To make my point, I present three abridged case studies below in which the *thinginess* of the social is shown to be all around us if we only have the eyes to see it.

Conversations in Mezquitán: learning to do more things with 'things'

Mezquitán, an *ejido* hidden in the folds of Mexico's Sierra Madre forms the backdrop for the research I carried out in 1987 for my Masters' thesis. During my fieldwork period, I had the chance to live and work, on an on-and-off basis and for a period of about six months, with Saturnino, a reserved but resolute farmer with little means and then in his mid sixties. During this period I had the opportunity of taping some of our conversations which often focused on farming. In fact, farming was Saturnino's passion. As a rule, Saturnino was either at his field (where he sometimes slept), at home, or coming and going between them. He was, however, not the average farmer: that year, he had been the only one in Mezquitán and the neighbouring *ejido* of San Francisco to obtain a full maize harvest on non-irrigated land. This made him a very proud man, as according to local cultural standards a good farmer is supposed to obtain a good harvest, provided there are no natural disasters. In what follows I present an abridged and, for the sake of clarity, edited part of these conversations. I have left out most of my questioning and in-between comments, as this is neither the place nor the time to indulge in self-reference. The purpose of presenting the material in this

way is to provide an impression of the *thinginess* of agriculture, that is, of the things that make agriculture possible.

On the timing of tasks

The most important part of farming is probably timing: when to prepare the land, when to sow, when to weed or when to harvest in such way that one works *with* and not *against* the elements. As Saturnino told me:

> '*Many things can influence the harvest. And if one is a good farmer, one ought to know these things. Listen, first of all one needs to know the state of the moon: some moons bring water, others don't. To know whether a moon has water or not one has to consult the moon calendar. For example, if it rains on the first day of the first moon of the year it will rain in the month of January. If it rains on the second day, then there will be water in February. If it rains on the fourth, it will rain in April. The important days to look for are the eighth and the ninth because they stand for August and September. If it rains on the eighth we're lucky, and we have to sow in May. If it rains on the ninth, it will rain in September and we have to sow in July... I'm interested in that calendar because it gives me life... For instance, this year's August moon was forecast to bring water, right? So I started sowing* en seco *[i.e. in May, before the rainy season proper]... When the August rains came, my maize was already producing its ears of grain... So the moon is telling you everything.*'

The moon calendar - and some specific days within it - thus sets the general parameters for the sowing date. But this remains too general. Saturnino:

> '*Of course I would like to know the exact day on which to start sowing! But that's not always possible. On the day you want to sow, you have to go to the land and see if she will receive the seed that day. If the land is willing to receive the seed, then there is no web on the soil. But if you go out there in the morning and see that there are webs on your soil, it means you can't sow that day. That's a bad day... That day the sun, and not the moon, is making contact with the earth... If I sow that day, the maize will not develop a cob. It will only develop leaves.*'

The sun and the moon, then, seemed to be important entities for they indicated the precise day that one could sow. This had implications for some of the economic decisions to be made, and even for the shape of Saturnino's network. For example, Saturnino used a tractor for deep-plowing, fallowing, harrowing and cultivating those parts of his land that were not too steep (there he would utilise a team of mares or a hoe). On those tracts of land where the tractor was used, Saturnino used to sharecrop with his neighbour Julián, who happened to own the only tractor in the direct vicinity. This amazed me because the price paid - sharecropping - was more expensive than renting a tractor when needed. When confronted with some figures, Saturnino replied:

> '*Well with renting I would be better off. Of course! But listen, the important thing is to ensure that the work is done on time... I don't gain a thing by paying somebody for a tractor and him not being around when I need him.* Valgo madres! *[I'd be worth nothing!]. We have to see things the way they are in life! Look, I've been to Autlán [a mid-sized city ten kilometres away] before to rent a tractor. I told the owner I wanted a tractor for sowing when then and then. He agreed, but when the day came, the son of a bitch said 'well you see, I can't come today.' So what did I gain? Nothing: I was screwed because one day means a lot when you need to sow: if I can't sow on that particular day, I can forget about the whole business. It will be too late and the maize*

will not thrive. So I tell you it's an advantage for me to sharecrop my land with Julián. If I tell him to do this or that, he does it. I can rely on him.'

On soil fertility

Agriculture is impossible on an infertile soil. Therefore Saturnino took great care to reproduce the little fertility his poor soils were capable of carrying. Deep ploughing was essential here. In his words:

'The most important thing about deep ploughing is that it exposes the broken up earth to the sun. The sun then starts burning the earth and breaking up the clods. This is called the salvia, *which gives fertility to the soil. If you have* salvia, *you don't need a fertiliser... Many people come to me, even so-called engineers, and they say: "but, you don't use fertilisers?" No, I don't. I don't because it's not to my advantage! My land is thin, and I'm only going to impoverish it more by using chemicals. The land: beat it. I'll improve it by beating [i.e. working] it. The soil is like a woman: you have to beat her so she can produce! It just needs ploughing and leaving fallow on time. And sun. Let the land take her share of the sun. The sun has much to tell the land. I know these rules because I still have Indian blood in me. That's why one knows of these things.'*

Experience was an important asset. Having seen multinational agricultural companies come (and leave) the fertile, irrigated lands close to Mezquitán only reinforced his passionate plea to conserve fertility through organic means only:

'Commercial fertilisers are pure chemistry, and chemistry will just do for a few years. After a while the chemicals will ruin your soil. Just look at the tomato producers around here. They've been impoverishing their land with chemicals for years, and now they complain about plagues! For instance, that fly, the white fly. You have to fumigate it, no way out. It arrived some eight to ten years ago. It arrived with the chemistry I tell you! If you're giving your soil chemistry you're plaguing it. Do you follow me? And what do these tomato producers do? They apply more fertiliser! Stupidity! I tell you, this place is slowly going to hell! But they [the companies] can leave the land when it's finished. Not me! I have to stay...! I just sow what the soil will give. I don't throw anything on it... I work! For example, if there's a plague, the thing to do is to plough the land and sow beans. When the beans start flowering, it's just a matter of turning them over by ploughing once again so that the soil has a chance to make some iron. Because iron gives oxygen to the soil and the soil can breathe again.'

On plagues

Saturnino emphasised the work that was needed to keep his soil fertile. He nevertheless let his *compadre* Carlos graze his cattle on the plot occasionally (and for a nominal fee) so Carlos' twenty cows could eat the maize stalks left behind and fertilise the soil with their dung. This was not devoid of problems, though:

'The agreement is very convenient for me, because Carlos is paying me for material I don't need anymore [the stalks] and the cows are there fertilising the land. But then I need to have knowledge of how things are, right? Because, for instance, if a cow is manuring the soil, well that's manure alright, but it will only help me if I plough or leave the land fallow before sowing. Because a cow's dung contains mizticuil *[a plague that eats the roots of the maize plant]. And when a cow steps on its dung, the dung will be buried and the sun won't get a chance to kill the plague. That's another reason why I always plough or leave the land fallow - to kill the* mizticuil*!'*

Generally Saturnino was able to control most plagues successfully. He attributed this to his careful handling of the soil. A number of crop diseases, however, could not be fully controlled. Saturnino labelled these diseases *chahuixtle*, which came in black or yellow types:

> '*The yellow one operates after it has rained and the maize is developing its cob. This phenomenon attaches itself to the plant, grows, eats from the cob and affects the yield ... The black chahuixtle is like falling ash. It operates when there's little or no rain. It's already working as soon as it touches the plant: it grasps the top of the cob and cooks it right there! After a while the plant turns completely black. Even if it rains there's nothing to be done as the plant is already burned!*'

Here, again, the timing of tasks was crucial. As Saturnino explained:

> '*I've had less trouble with these plagues than others have. That's because I closely observe the first days of the moon calendar. After the eight and ninth day have told me about the rains in August and September, I know whether to expect* chahuixtle *or not. If the rains are going to be poor I can expect the black* chahuixtle *to come. If good rains are predicted I need not worry about it. And if the rains are expected to be mediocre I can expect yellow* chahuixtle. *I know this because if, for instance, the morning of the eighth day of the first moon is overcast and the afternoon clear, it means it's only going to rain the first half of August. And if it rains that whole day then it will rain the whole month of August and there'll be no black* chahuixtle... *Some years I know the* chahuixtle *is coming anyway so then I better sow something other than maize!*'

On crop choice

As the last sentence suggests, crop choice may be a function of diseases expected. In cases when maize could not be planted, sorghum was often the crop of choice. But here, too, things were not always so straightforward:

> '*It's not too smart to have a crop of sorghum twice or thrice on the same place, because your fertility will go down and you'll need extra fertiliser. The sun will produce* salvia *anyway after the ploughing, but the problem is this: when you let the cattle in after the harvest, they will not produce enough manure. That's because sorghum has very short and fragile stalks and the cows will trample it and not eat it anymore. Maize is much better, because the stalks are resistant and tall so the cows will eat them all. You can never keep cattle on a sorghum plot as long as on a maize plot. With sorghum, your soil gets less manure... So maize is much better! But sometimes there is no way out and you have to sow sorghum anyway. For example, my son Pancho has his plot next to a piece of land rented out to a tomato company. So when these bloody tomato pickers come to harvest ... if they can, they will steal half your maize harvest! They are from Michoacán, Guerrero, Oaxaca. You can't trust them! Once you sow sorghum, the cutters can't steal it, because sorghum is for the cows. You can't eat it, right?*'

The conversations with Saturnino clearly overflow accounts in which the main role is laid aside for human actors only, and points to the heterogenous character of what we normally call 'the social'. Let us learn from this and embrace, with both arms, what the many Saturninos we engage with urge us to do: '*design your sociology in such way that it can accommodate all elements of action*'. I return to this point in the last section of this chapter.

Tinkering with consumers: under the influence of *mezcal*

I had the dubious pleasure of carrying out some research on the Mexican liquor industry in 1994. The location was the dormant township of Tolimán, lying under the smoke of a towering volcano some 100km east of Mezquitán. One of actors who featured in my work was León, a producer of *mezcal* (distilled liquor made from the heart of the agave plant and a generic name for its more infamous cousin, *tequila*). León, like many other distillers in the region, was desperately trying to work out how to enlarge his market share. In nearby hamlets 27 fellow producers were also pondering questions such as 'what means must I employ to enlarge my clientele?' or 'how can I can out-smart the competition?'

Unfortunately - and this was at the root of the *mezcal* producer's worries - no straightforward recipe existed for enlarging market shares. This does not mean they were ploughing the dark with their minds only. All producers had, to a greater or lesser extent, a way to gauge 'what the market wants'. They were aware, for example, that the market has a topology of its own. Thus *tequila* is the undisputed king of the pile north of Guadalajara, while *mezcal* is hard to beat on its home turf to the south of the five million-plus megalopolis. Also, they knew from experience that yellowish *mezcal* aged in oak barrels does well in the nearby states of Colima and Michoacán, while white *mezcal* straight from the still is fancied in the vicinity of Guadalajara. Likewise, producers knew that sales go up in the post-harvest season (when farmers have plenty of cash) and during patron saint *fiestas* and rodeos - only to plummet in the spring and during the hot season when cold beer is highly preferred. In addition, producers were well aware of the way in which consumers classify the taste of *mezcal*. Thus the term *vino* is used to refer to cheaper, often down graded, types of *mezcal* while *tequila* refers to a *mezcal* obtained through a specific way of processing the main ingredients (and through which the end product loses its harsh, characteristic 'woody' flavour). Finally, the term *de olla* designates a *mezcal* prepared in the traditional way. The qualities of this latter type of liquor are highly appreciated, and today prices for it are in the range of USD 25-250 per litre.

In an ideal world, producers might be able to convince consumers to prefer their liquor to that of their competitors by offering their best *mezcal*, that is, *de olla* quality, for a reasonable price. In reality, however, this proves difficult because producers work for a profit and unfortunately for them, quality *mezcal* is scarce and therefore difficult to make a living from. From the perspective of the producers of Tolimán then, the closest thing to a recipe for success was to have one's *mezcal* resemble, as much as possible, 'ideal type', traditional *de olla* quality - and sell it at an affordable price. This meant that producers would advertise their premium *mezcal* as being made on the basis of mature agaves of the green or *lineño* variety, slowly cooked on wood in a traditional underground basin, fermented without any additives or artificial boosters, with an alcohol percentage of close to 50°GL and, depending on the region it was to be sold in, aged in barrels made from French oak. To corroborate this, consumers would look for specific traits. The liquor has be brownish in colour, make long-lasting bubbles when the bottle is shaken (any distilled spirits over 46° will do so), leave an 'oily' stain when in a glass, and have a slightly sweet but 'earthy' taste and a 'smoky' odour. In their desire to conform to consumer ideas on quality, producers would sometimes turn to tinkering with the ingredients. They would

use glycerine, soap, almond essence or ammonium sulphate in the different phases of the production process so that the final product resembled what was expected of it. This however is a cat-and-mouse game because consumers could get wind of it (gossip travels quickly!) and turn their backs to a brand breaking the rules. These cat-and-mouse games (I prefer to call them 'knowledge encounters') drive the *mezcal* industry. Trying to be ahead of consumers and competitors, however, means that one has to go beyond the certainty of what is already 'known' (i.e. the topology of the market, the classification of taste) and venture into the dark: 'Will consumers accept my latest ruse? Will they like the changes I have made to my product? Will they be positively *influenced* by my new offer?' It is to this type of questions that I now turn.

In 1991, for example, León ventured into unknown territory by increasing the output per unit of agave. This entailed substituting the local, 'green' variety of agave for so-called 'blue' agaves (used for the production of *tequila*) which have a much higher fermentable sugar/weight relation. The gains to be obtained were substantial: prices per kilogram of agave were almost the same, but whilst León needed 20 kilograms of 'green' agave to distil one litre of *mezcal* this same litre could be manufactured with 7-10 kilograms of the 'blue' variety. The crucial question was: Would his customers notice the somewhat 'softer' (but less appreciated) taste of the 'blue' variety? The consumers were not long in replying, punishing León by switching to other brands once they had discovered that his *mezcal* tasted like *tequila* (a 'bad' attribute for 'good' mezcal). León kept experimenting for a while with the ratio of varieties used but, after a lack of success, he aborted the strategy of increasing the input/output relation.

A full year later, and after having recovered to previous sale levels, León tried out a new stratagem to increase the input/output relation. This time around, the trick consisted of shortening the fermentation time (which usually takes between 8-10 days) by heating the fermentation tanks and increasing the temperature and speed at which the ferments converted sugars into alcohol. The new strategy however turned out to be self-defeating: as León soon realised, to decrease fermentation time in any noticeably way required a prohibitive amount of fossil fuel, thus making the final product more expensive - even though conforming to customer expectations.

Two years later León gave it another try. Shortening the cooking time of the agaves was the name of the game this time as great gains were to be achieved on this front. Normally agaves are cooked in a series of time-consuming steps. First, wood is burnt inside a large basin (*olla* in Spanish, which is where quality *mezcal* derives its name from) some three meters deep and three meters across. Once the fire is going the wood is covered with a layer of fist-sized stones that absorb the heat. Then 2-3 tons of chopped-up agaves are placed on top of the stones and covered with a layer of earth to prevent air from coming into contact with them. After some 60-72 hours of 'cooking' the sour saps of the agave plants have converted into sugars (to be fermented at a later stage). The layer of earth is then removed and, after a day of cooling off, the agaves, stones and ash are taken out. The whole process, however, can easily be shortened and producers of *tequila* have been doing so for decades. The shorter method, which had recently been taken over by some *mezcal* producers in the region, consists of steam-cooking the agaves in a so-called *autoclave* or *caldera* (a sealed chamber in

which vapour steam is injected from below). Because of the higher temperatures, the agaves only take 20-22 hours to hydrolyse.

Although the initial equipment is expensive (a steam engine has to be purchased), the investment can in principle be recovered in a matter of months. The problem with this time-saving method (and this was common knowledge) was that, in the process, the taste of the *mezcal* is influenced because it no longer comes into contact with smoke and earth, thus losing its characteristic and highly appreciated 'earthy' and 'woody' taste and odour. Since León did not want to be thrown back to square one by having his *mezcal* taste like *tequila* he opted for an alternative: an increase in efficiency through an innovation in the cooking process. The innovation itself consisted of a brick and cement chamber that could hold 6-7 tons of agaves. These are brought into the chamber through a heavy, metal door sealing the chamber from the outside. Inside, tiles capable of withstanding high temperatures shield the chamber. In effect, the chamber is akin to the *calderas* of the *tequila* producers but what is innovative is that, underneath this chamber, there is another room containing stones that spread the heat generated by burning wood located on yet a lower level. Metal grids separate the three compartments to prevent the agaves from coming into direct contact with the stones, and the stones from falling onto the burning wood. The lower compartment is below surface level, and can be accessed through a stair that connects to a tunnel and a metal door. The innovation does not diminish cooking time, but is a revolution in terms of throughput as the whole process involves only two steps (as opposed to 8 steps in the 'traditional' set-up). Most importantly, agaves are still cooked on wood for 72 hours which means that the final product retains the 'woody' taste of premium *mezcal*

As with the conversations in Mezquitán, what this condensed case makes abundantly clear is that any attempt to make sense of the knowledge encounters involving producers and consumers of *mezcal* must take into consideration the many non-human elements that are successively implicated in the story. What is referred to as the 'knowledge of the consumer' cannot be rendered precise without first understanding the role of things. I return to this issue in the last section.

Borrowing support: learning to make bananas swell

In the mid-1980's, Costa Rica's agriculture seemed to be grinding to a halt. The administration of President Arias provided a diagnosis for this in which the country's problematic situation was coupled, among other things, to high external debt, the collapse of the import-substitution model, technological backwardness, and the uncertain land ownership situation of the majority of smallholders. The administration also provided a solution to these problems by referring to a vocabulary of structural adjustment involving such disparate elements as open markets, non-traditional export crops, land-titling or eco-tourism, heralding these as potential saviours of the Costa Rica's agricultural predicament. In this scenario roles were set out for a variety of players. These included line ministries, multinational companies, non-governmental organisations as well as farmer co-operatives and growers' associations willing to grow non-traditional export crops - a good foreign currency earner.

In the short case study that follows, three of these actors come together in a project oriented towards the production of plantain bananas. The first player in the project was TAPA, the growers association located in the Atlantic Zone, close to Panama's border. The second actor was MAG (the Ministry of Agriculture an Animal Husbandry), responsible for providing extension services to the 31 members of the growers association. And finally, Del Monte, a multinational company in charge of exporting and selling plantain bananas on the U.S. market.

Initially, the goals of the three parties seemed to converge. TAPA could fetch high and stable prices for its bananas, and its members would be covered by insurance against flooding (a recurrent phenomenon in the region). MAG in turn would boast Costa Rica's first such export agreement and appoint one of its extensionists *in situ*. Del Monte, on its part, would profit from the lucrative export product without having to carry the operational risks involved. In addition to a convergence of interests, all parties coincided on the manner in which export-quality plantain bananas should be grown. Thus it was agreed that a comprehensive technological package involving drainage canals, a packing plant, biocides (i.e. nematicides, fungicides, herbicides, protective bags sprayed with insecticide), fertilisers, and so on would be gradually introduced. The parties agreed that the cost of the package would be born by the farmers themselves who in turn would be able to obtain the money to do so through a credit arrangement with the Costa Rican Development bank.

Introducing the technological package, however, proved difficult and after a few initial shipments, export-quality plantains were not produced in significant quantities. Accusations as to whom or what was responsible for the project's failure abounded. MAG blamed Del Monte (which had no experience in the production of the crop) for trying to introduce a technological package based on the assumption that plantain bananas (essentially a smallholder crop) would react as well to increased technology and crop management as their banana cousins (a plantation crop). Del Monte on its part reproached MAG for the incompetence of its extensionist who seemed to be unable to convince farmers to *properly* adopt the proposed technological package. Also, the multinational accused farmers for their ignorance and non-entrepreneurial mentality. TAPA's board of directors in turn believed that the output decline was related to a general lack of responsibility among the associates, the absence of a strong feeling of group solidarity, and insufficient use of technological expertise in crop management. At the level of the farm however these simple accusations were challenged by a murky and complicated reality. As it turned out, the plots of TAPA's Black, Amerindian, and *mestizo* associates were very dissimilar, ranging from a quarter of a hectare to over 35 hectares. Crop intensity varied from 750 to over 3,000 plants per hectare - with huge quality differentials in terms of soil composition and final output. Some associates appeared to have financial obligations with parties other than Del Monte (such as moneylenders): when in need they could not wait for the multinational's cheque to arrive and were compelled to sell their produce to local middlemen who competed with the multinational for the better banana specimens. The dynamics involving middlemen, moreover, was closely related to the initial agreement between Del Monte and TAPA, and meant that farmers would receive USD 7 for each 50lb box delivered to the multinational. Each box could hold an average of 3 bunches of export-quality plantains, but

farmers soon realised (after the first shipment) that after the deduction of overheads, freight, handling and taxes the average price they obtained was just over USD 1.30 per bunch: a figure only slightly higher than the USD 1.10 paid for by local middlemen. Since middlemen punished farmers with price reductions of up to two-thirds the normal price when quality, size or ripeness were not optimal, many associates were inclined to sell their larger bunches of quality plantains to middlemen while selling the relatively smaller bunches to their own association.

After some complex struggles and negotiations involving the three main actors as well as high-ranking politicians from the capital city of San José some major changes took place (cf. Verschoor, 1994). The multinational provided its own extensionist but now wished to have a contiguous area planted in bananas so that *sigatoka* (a fungus disease) could be controlled through aerial spraying by low-flying aircraft. This meant that more associates needed to join TAPA, and MAG helped in this through all sorts of artifices - including blackmailing. Some changes took place at the level of the association as well. For example, a new packing system was introduced by which plantains were now packed on the associates' individual plots, and no longer in a common facility. (In order to make the new system operational, new dirt roads and small packing sites were constructed with the help of a donation from the Dutch Embassy). The new system entailed that individual associates would be personally responsible for cleaning, choosing and packing only the best plantains they produced. Through increased control, associates were henceforth monitored and individually penalised for low product quality as each box of plantains carried the owner's name.

As the case suggests, the room for manoeuvre of the different actors involved changed throughout the project. Such disparate elements as plantain bananas, chemical compounds or politicians having no relationship with one another prior to the identification of the project, ended up being connected in increasingly compelling ways. In the end, some actors were able to control others. TAPA's Board, farmers and plantains could no longer close ranks with actors other than those explicitly allowed in the network assembled by MAG and Del Monte. Through a contract, farmers accepted the introduction of a technological package and a quality control system that diminished their capacity to make individual decisions. They could no longer sell to middlemen or be careless with plantain quality without risking penalties. Like the farmers, the plantains, too, were subject to export-quality demands and made to swell according to the guidelines of a multinational, which, for a time, borrowed the wills of others *without* fully owning the project. This case thus exemplifies the mobilisation of power - an issue I take up in the next section.

Becoming infected by fieldwork: a risk worth taking

The sequences of action portrayed in the short case studies above are rich in instances in which things progressively affect our main actors. In Mezquitán, Saturnino was entangled with objects, techniques, possibilities, and constraints. *Mizticuil, chahuixtle, compadres, salvia,* the sun, the moon, the rains, a tractor, a calendar, maize cobs, webs, work, ploughs, the soil, cows, tomato pickers and

Saturnino himself: they all infect each other so as to collectively arrange the details of that graceful and harmonious dance called agriculture. In Tolimán things were no different. There, León gained familiarity of consumer preferences through a painstaking learning process that includes judicious tinkering with both human *and* non-human elements such as ferments, agaves or innovative technologies. Likewise, in Costa Rica plantain bananas swelled to export-quality proportions when farmers closed ranks not only with extensionists, middlemen, and politicians but also with biocides, fertilisers, and management directives. Crucially, it would be a mistake to say that any one of the actors involved in these cases 'own' any of these stories: in their particular way, each of the actors can simultaneously be seen as 'owners' and 'owned'.

What lesson should a development sociologist draw from this? If interested in testing assumptions, becoming infected by the object of study would not be a bad idea. Thus he would not try to determine either Saturnino's, León's or Del Monte's ontology by deciding, on his own, what their respective worlds are made of. Let us continue this line of thought with the example of Saturnino: if, to Saturnino, agriculture maps out a world in which people and things all play crucial roles, then our development sociologist should respect this - even if it contradicts his received (and cherished) notions about society or agriculture. Instead, he would need to question the standard categories of social scientists which have it that it is the humans that act, while the non-humans (the sun, the moon, the *chahuixtle* or the *mizticuil*) are merely passive objects. If he wants to understand the type of agriculture exercised by Saturnino *in terms of Saturnino* (as any actor-oriented sociology would propose) then the following passage might be of help:

> '*We are never faced with objects or social relations, we are faced with chains which are associations of humans (H) and non-humans (NH). No one has ever seen a social relation by itself... nor a technical relation... Instead we are always faced by chains which look like this H-NH-H-NH-NH-NH-H-H-H-H-NH...*' (Latour, 1991: 110)

This is precisely the point were any actor-oriented approach bracketing the *thinginess* of the social goes awry. Of course, Anglo-Saxon sociology has heard of STS before, but it has misinterpreted the message by taking it as a proposal to grant agency to things. As Latour and others have been at pains to explain, the issue is not to grant agency to things, but to think of agency as a composition of forces:

> '*It is by mistake, or unfairness, that our headlines read 'Man flies', 'Woman goes into space'. Flying is a property of the whole association of entities that includes airports and planes, launch pads and ticket counters. B-52s do not fly, the U.S. Air Force flies.*' (Latour, 1999a: 182).

In Saturnino's case this means that it would be incorrect to state that it is *he* who practices agriculture when this is in fact an activity jointly performed by an ensemble of elements (*including*, of course, Saturnino). This may be hard to grasp for anthropocentric science, but even if one sticks to the notion that it is Saturnino who practices agriculture, this in no way justifies leaving outside of the story those elements that enable Saturnino to carry out his activities in the first place. Such a silencing of reality reduces complexity and ironically contradicts the philosophy of Long's actor oriented approach.

Taking the entanglements between people and things seriously has implications not only for the notion of agency, but also for two other concepts that are central to Long's actor-oriented approach: knowledge and power. The case of León, for example, points at what is usually termed 'knowledge'. Contrary to so many accounts, 'knowledge' about consumer preferences is not gained by way of an invisible quantum leap that takes León from a state of sheer 'ignorance' to a condition of 'knowledge'. The progressive and cumulative process of becoming knowledgeable about consumer preferences involves knowledge encounters at the interface between producers learning to be influenced by consumers (and vice-versa). This can in no way be understood without taking due account of the potentialities that bottles, stills, fermentation tanks or agaves offer León. Worse: no project or programme that aims to help producers (including those of *mezcal*) to enlarge their 'knowledge base' (and thus market share) will ever achieve its goal if knowledge is taken to be something that is confined to cognitive processes contained within producer's minds. Likewise, 'power' is not something that resides within a human (or, for that matter, a non-human). Power or force can only be understood by taking into account the complex fusion of people and things that *together* borrow their support and potency to specific projects of the happy few (and that, in turn, can neither be reduced to any one actor in particular). Take the case of plantain bananas, for instance. Farmers, dirt roads, extensionists, technological packages, politicians, Del Monte and plantain bananas all borrow their *potencies* to a project without a clear 'owner' and composed of an equally heterogeneous set of elements: Del Monte, extensionists, U.S. consumers, structural adjustment programmes but also plantain bananas and the farmers themselves. Power here becomes increasingly mixed up in the machinations of humans and the possibilities and constraints offered by things. Boundaries begin to blur as one delves deeper into the intricacies of the case, thus making it increasingly difficult to state that power is a property of individuals or groups. Not comprehending the distributed nature of power (or agency and knowledge for that matter) renders invisible the dynamics of social change and results - as the history of social science demonstrates - in redundant and tame explanations that are often cast in terms of essentialist oppositions (micro/macro, subject/object, agent/structure, free/determined, and so on) and that are incapable of making a difference.

A few plain examples from Mexico and Costa Rica suffice to make one thing clear: the time in which development sociology could fabricate good science about social change without paying due attention to non-humans is forever gone. It would be unfair, however, to characterise the work of Long as being insensitive to this message which resonates the findings from STS. There may be many reasons for this, and one of them relates to what Clyde Mitchell once said during one of Long's Advanced Research Seminars, namely that 'to be a professor is a long slow slide to illiteracy'. Mitchell was anything but illiterate, but the point he was making was that it was a shame that our best brains end up losing so much time with petty administrative issues. Whatever the reasons: Long's first references to the work of the pioneers from STS date back a decade (Long, 1992), and STS authors were already compulsory reading in his 1989 Research Seminars. It seems, however, that these references were used as rhetorical devices only, for they did not have a direct effect on the design of an

actor-oriented research programme. Long's most recent book (Long, 2001), though, seems more receptive to the proposition that actors are composite phenomena.

The table is set for Long's approach to become 'infected' once again - not by Anglo-Saxon models of the actor, but by flesh-and-blood actors. There is nothing out there to stop this, and nobody needs to feel ashamed of showing an unreserved sensitivity and commitment towards the people we study: on the contrary, there is much pride to be gained in doing so. For too long, Development Sociology has been blinded by the social. Why not - like Saturnino, León, or Del Monte - take the entanglements between actors of a different *genus* in earnest? What would be against turning Development Sociology into the study of the hetero-*genus*, of materialities as well as socialities? Let us turn things on their head again, and become dangerous once more without fearing ridicule. Contrary to what Napoleon said, from the ridiculous to the sublime is only a step!

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