Working at Mozal: the construction of a "border culture"

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By the end of 1999, a state-of-the-art aluminium smelter started its production near Maputo, Mozambique.

The strategy of its managers was to train the future workers starting from a "blank sheet of paper", in order to achieve, from them, an high degree of proficiency and technological rationality.

However, even if the level of workers' expertise, productivity, commitment and proceedings compliance is quite exceptional, in Mozambique or even around the world, of course those men were not conceptual "blank sheets", nor was the surrounding society. A second result of that strategy was, therefore, the development of a specific "border culture" inside the plant – I mean, a set of shared concepts and practices which merge the company policies, the recently acquired knowledge and interpretation systems and those that already existed in the society.

Such kind of process is very usual, under different forms, almost everywhere. However, there are three important specificities in the Mozal case which I would like to emphasize and debate in this presentation:

First, this new plant was perceived and thought as an open-sky South-African mine, and that perception brings important consequences to the collective notions about industrial danger and to the safety inside the plant.

Secondly, the construction of the border culture I mentioned was not based on a syncretic incorporation of the new rationalities, but on the coexistence of separate interpretation systems, used alternatively according to the circumstances.

Finally, the technological rationality and the spirits-based one revealed to be, in this case, not opposite but complementary – as concepts, and in the safety attitudes.

I therefore suggest that, under similar circumstances, "modernisation" processes or even the generalisation of technological rationality do not induce the death of "traditional" interpretation systems. In fact, as far as the later are still useful for people in an unique way and are not incompatible whit the innovative forms of rationality, there isn't any good reason why they should be jeopardised by them.[1]

The open-sky mine

The announcement, some 3 years after the end of the civil war, that a huge and very modern factory would be settled near Maputo surprised the population, raising speculations about the reasons for that project in a country which was, by that time, classified as the poorest one on world.

A first "street interpretation" stated that the project would derive from the marriage between Nelson Mandela and Graça Machel – like some kind of industrial bridewealth. The public polemics about the possible environmental impact of the plant, however, brought the spread belief that such factory would be build in Mozambique because it was very pollutant, and nobody else wanted it on their own countries.

[1] The empirical data for this presentation result from an anthropological field research developed at Mozal since 2002, complemented by interviews and the observation of Mozambican healers' practices, since 2004.

A decade later, this image is still attached to Mozal, and it was a key element in the peculiar conceptual model which was adopted in order to perceive the plant and the work performed there.

It is indeed understandable, retrospectively, that the previously settled industries were not a very suitable model to think this new reality. Independently of the fairness of this image for each individual case, the existent plants were, in general terms, popularly seen as national, using obsolete technologies, falling down in pieces, managed in an easy-going or even corrupt way – and all those characteristics were the opposite of what was said and known, since the start, about the big factory to come.

On the other hand, even if the urban life is a relatively new experience to the majority of Maputo families and rurality keeps on providing essential references to them, the rural notions about work don't manipulate just "traditional" agricultural references, or a logic of "subsistence economy". Together with them, the memories and representations about compulsory labour, cotton coercive raising and commercialisation, or the mining migration to South Africa became, since the colonial period, part of the "rural" work conceptualisations.

Furthermore, in the case of the mining we deal with a massive phenomenon which apparently endured since before the Portuguese occupation of the hinterland (in 1895) until nowadays, inducing major social changes. If it was in large measure required by the introduction of monetary circulation, the temporary mining migration reinforced it, contributing to the generalization of money use even in practices like *lobolo* (bridewealth). So, besides its impact on the economical exchanges, on the access to manufactured products, on the micro-social power relationships, or even on the religion or the aesthetics, to go to the mines became essential to marry and, therefore, to achieve the manhood and the physical reproduction of the group.

In short, after more than a century of temporary but massive migrating experience, most southern Mozambican families had members or ancestors in the mines, and the knowledge and imaginary about that kind of work and its dangers are significantly strong and spread.

Those socially shared representations ascribe four main characteristics to the mining labour: i) it is hard and "men builder"; ii) it is a well-paid but temporary situation; iii) there is a huge danger of accidents during working time and the lungs get destroyed after it; iv) it happens in a special space, subjecting the worker to different rules and to abuses from "white" South-Africans.

Looking back, we can notice that, independently of the justice or injustice of that extrapolation, almost all those representations could be tagged to Mozal, as well.

Since it is hard to accept that a plant may harm what's around it and be harmless behind doors, to conceive it as dangerously pollutant implied the conviction about the danger of the work performed there. It would be, though, a specific kind of danger, the same one ascribed to the external impact of the plant: the pollution by contaminative dusts and gases – so, the same kind of deferred danger that used to be related to mining work.

Also the notion that work would be exceptionally well-paid by local standards was an early new, and the conjugation of those two ideas provided the base to consider the jobs at Mozal as temporary, as an hard way to accumulate the financial means for a wealthy and healthy livelihood, elsewhere.

Besides, although the company capital is transnational and the main stockholder is officially British,[2] Mozal is systematically mentioned by the media and the common people as a "South African plant" – and I guess the conspicuous initial presence of South African staff, together with the references to the "sister smelters" of Richards Bay, had much to do with this classification.

Those metaphorical potentialities were manipulated and reinforced during the strikes of February and October 2001. The press references to the «*South African plant*» went, then, together with its presentation as a space of exception apart from national labour rules, and with the rumours about some South African company trying to hire (like a kind of industrial Wenela)[3] Mozambican substitutes for the strikers, or about «*boers'*» racist verbal abuses in the shopfloor.[4] By February, the references to work conditions mainly stressed its hardness, due to the high temperatures of the smelting pots, but in October the main issue was already the lung hazards, whether workers wore or not their safety equipment.[5]

In a tautological process, what started as a metaphor, as a term of comparison in order to think about the new plant, became the matrix which directs the perception and the analysis of everything that people ears about the company. I mean, at start, aspects vaguely coincident with people's knowledge about mining work legitimated the use of the mines as a comparative base to interpret this industry; then, the new look over the plant arising from this comparison called the public attention towards other analogies; those analogies, in turn, invited for *mutatis mutantis* comparisons – until the moment when, finally, one says about the plant what is normally said about the mines, in a direct transposition of the mining symbolic references to a new industrial reality.

The result of this process is eloquent outside the plant. Almost everybody I questioned about Mozal workers said, as it is usually said about the miners, that «*they are well paid, but they get their health ruined*», often reproducing the resilient rumour that «every week workers from Mozal arrive to Central Hospital with their lungs destroyed», or the old sentence «*once they work 5 years over there, they only have 5 more years to live*», even when the plant did not existed for that long.

The impact of this process is, however, more important in the potlines. Over there, we can notice that a large amount of workers keep wearing their uncomfortable protective masks even where their use is not mandatory or indeed necessary. This particular care is, however, quite disproportionate when we compare it with the concern towards other hazards, even if they are more visible and immediate. For instance, I could see a driver carrying a suspended ladle containing some 23 tones of melted aluminium, the lid of which he forgot to close, although he was wearing the mask while circulating at open air and was carrying a non pollutant product that, nevertheless, could burn him to death. We may also go on observing small subversions of rules which could lead to severe injuries, even in the case of people that, after it, will leave the place with the mask on.

So, in contrast with the usual attitudes in industries around the world, the workers focus their attention in the invisible hazards with deferred effects, instead of the more visible, immediate and injuring

[2] BHP Billiton, a fusion of two mining companies, one Australian and the other one a part of the previous Gencor Corporation, from South Africa. The other stockholders are the Japanese conglomerate Mitsubishi, the South African IDC and, with a small percent, the Mozambican State.
[3] Correio da Manhã, 11.10.2001: 1.
[4] Expresso da Tarde, 11.01.2002: 4.
[5] In a translation which tries to keep the writing style of those news, «it's indispensable the use of gas masks in several sectors, with the risk of death or severe illness to anyone who doesn't wear it» (Correio da Manhã, 16/10/2001: 3); «even wearing masks, they mention that for breathing purposes, those instruments demand twice the normal effort in order to win the air and manage to breath, which easily allows one to get bronchitis» (Imparcial, 18/10/2001: 3).

ones. They may sustain their attitude by saying that *«if managers recognise that the dusts and gases are dangerous, they must be really very dangerous, and I need to protect myself, because I don't know what else do they hide»* - although virtually every other hazard is emphasised by the managers, and no other gets the same attention from the operators. They may even manipulate references from other contexts and ask you: *«Whom should you fear the most? A man that you see in a dark street with a gun, or God, who nobody can see?»*; but, if you point out that the hazards from which they protect themselves the most are silicosis-like, someone will finally answer: *«But this is like a mine. We work at open-sky, but it is the same. This is an open-sky mine.»*[6]

The workers' adoption of this conceptual framework which equates Mozal to a mine brings, however, other consequences to the labour notions and attitudes.

Since the same job combines high salaries and an image of treacherous danger, it as all the conditions to be seen, from that point of view, as a temporary situation that provides the means for better life alternatives. This is indeed the case of a large amount of workers, most of them youngsters who completed high school and see the present salary as a key for social mobility, trough a future university degree.[7]

Together with its plausible medium-term impact on employees' commitment, this attitude weakens the potentialities for the development of a workers' collective safety culture, which isn't indeed detectable nowadays.

The excessive protective cares I just mentioned are focused in the safeguard of the individual physical integrity, and go along with a minor care towards the hazards that might affect all the colleagues. As an example, it's usual to over-ware the individual mask but leave the pot hoods open for long, raising the quantity of gases and dust in the work area, where everybody else will need to circulate. Of course such self-centred perspective towards the hazards tend to be reinforced if you conceive the job as a temporary situation, through which you must pass unscathed to a later life; it is however consensual that the development of collectively shared *prudence skills* requires the development of spread feelings of individual responsibility for everybody's safety.

Besides, to focus the attention on a specific kind of danger is not innocuous to the way people act towards all other hazards and, consequently, to safety. In one hand, the invisibility of the respiratory hazards and the workers' belief on hided information about them reinforces the sensation of its unpredictability - which, by contrast, induces the notion that hazards like melting metal are kind of predictable, and a relatively at-ease attitude towards them. In the other hand, our ability to be aware of the sensorial inputs around us is neither infinite nor indiscriminate. To fix the attention so strongly on a specific hazard can only, then, be affordable with the cost of a minor attention and devaluation of all other dangers.

Therefore, folk notions which are rooted in the historic memory of mining labour and looked like innocuous ethnographic curiosities revealed, after all, to be at the genesis of relevant factors of industrial danger.

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[6] Quotes from conversations with workers in the potlines, in 2003.

[7] *«The work is too dangerous and will harm my health more and more. I really don't want to stay here for the rest of my life, but I couldn't go on with my studies. Now I have money and, later on, I will go to university and I will get a good job, even with a little lower wage.»* (a young operator, in 2004).

The technology and the spirits

Independently of their self-centred attitude of protection, during daily labour the workers are very attentive to general safety matters. Besides the conscience of working in a potentially harming environment, that's probably due to the underlining of safety issues throughout their professional education, and to their knowledge that reporting potential hazards will be rewarded in their evaluation and promotions. They often discuss amongst them safety issues, working proceedings or the reasons for occasional problems in the production process – and, in all those conversations, they use the most strict technological rationality and they ponder exclusively the material causal relations.

Those dialogues are, indeed, a bit surprising to an anthropologist. Not so much because we seldom can hear a so strict and exclusive use of "technological" thought outside scientists' and engineers' debates, but mostly because those men had a long previous contact with other logics of causality, and because new conceptual frameworks and notions are usually perceived under the light of the previous ones, leading to the adoption of syncretic interpretations of the novelties.

This is not, clearly, the case. In order to understand this, we should keep in mind that we deal with a very specific group of people, in a very specific situation. When the plant started, 2/3 of the workers were less than 25 years-old, only 1 in 15 had previous industrial experience and almost all of them completed the 12th year of high-school.

So, they were familiar with the underlying logics of school education - which are after all common to "western" technological rationality - and they were raised after independence, under a modernistic regime which repeatedly proclaimed this rationality to be superior, truthful and effective, while the *«obscurantism»* of "traditional" beliefs was repressed. I believe those conditions stimulated a strict learning and use of a rationality model which essence, in fact, was not unknown for them.

Besides, their professional education inside the company was strongly based on the teaching of Best Operation Proceedings, very detailed lists of items which divide each specific task in its most elementary steps. Those proceedings are established as "the right ones", its compliance is demanded and it's a criterion for the operators' evaluation – implicitly supporting and demanding, again, the use of strict technological rationality.

Contrasting with this workers' mental and practical attitude during daily tasks, however, I could go on noticing discrete amulets, scars from healers' *«vaccine»* treatments and, later on, hearing stories about the hair that most of them sent inside the application envelope, or about why nobody should kill animals inside the potlines, specially if they were snakes.

Our time is short to explore all the cultural presuppositions involved in this later reinterpretation, by the workers, of the company's ecological policy. I must however underline that it implies and reveals a complete set of so-called traditional beliefs, directly connected with misfortune regulation.

Besides the possibility of being poisonous, snakes are regarded as specially threatening animals because they can always be, as well, the material residence for the spirit of an important deceased, the vehicle for a sorcery action, or the message from an ancestor, calling his descendant's attention to the fact that he must be heard through divination. Moreover, their presence is almost expectable in every special, contrasting or ambiguous place or landmark (such as this plant), and their ontological and cosmological task can occasionally be fulfilled by other vertebrate animals.

Therefore, it is entirely logic to fear that killing a snake in the potline will attract labour accidents, since that animal congregates in itself all the possible principles and causes which are manipulated in the Mozambican dominant system of uncertainty interpretation and management.

According to that system, everybody is surrounded by many material threats, which follow material causes and logics. Material causality, however, only explains how did an accident happen; it is not enough to understand why did that accident harmed that specific person. So, people can only be harmed by external threats if, besides the material causes, a social cause occurs as well.

The first possible explanation is the victim's inadequacy to do what he did - because he was ignorant, unskilled or careless. Only if this didn't happen can the explanations of spiritual or magical nature be equated.

One of them is sorcery. In this case, somebody wants to harm that person and performs or orders a spell; because of it, the victim will decrease his attention towards surrounding hazards, and will be harmed by them.

The other one is the action of victim's ancestors. They have, towards their descendants, the same rights and duties as the living elder kin, so they must protect them, discipline them and be respected. But, since they are the remains of previous human beings, they loose some human abilities, such as communicate directly with the livings. So, if the victim did (or somebody in his family did) something that displeases his ancestors, the later can only call for his attention by suspending their protection against hazards, or by attracting him to the danger. This will not be a punishment, but the only available way to make the living person aware that something is wrong, and to seek divination in order to know what it is and how to correct it.

The contrast between the workers' purely technological speech and this later system of interpretation compelled me to check how many, how much and how do they believe in it. The data from a sociological questionnaire which I collected amongst the operators confirmed a situation that, although most interesting, is not at all unique.

Only 1 worker in 6 denies the existence of spirits, their influence in our lives or the dangers arising from sorcery. Nevertheless, just about 1/5 agrees explicitly that the action of ancestors and the killing of animals can provoke accidents, although 1/3 says the same thing about sorcery. Simultaneously, the sentences which sound like techno-scientific statements receive levels of agreement varying from almost majority to almost unanimity, even when they contradict each other or contradict the caution principles learned during professional training.[8] Moreover, the workers who answered that accidents can only have technical or human causes agree, more than the others, that God, the sorcery and the ancestors influence the accidents.

The meaning of those formal contradictions becomes clearer when we read the questionnaires one by one, or go on debating those issues with individual workers. The agreement with techno-scientific statements is expected, as it is expected to use technological rationality while operating the machinery.

[8]

	agreement	doubt	desagreement
Accidents can only have technical or human causes	77,4%	2,8%	19,8%
Unpredictable technical factors can lead to accidents	95,8%	-	4,2%
With good maintenance and careful operation, there are no accidents	42,2%	8,5%	49,3%

So, the workers provide almost automatically the answers that are demanded from them; but that doesn't obstruct them from equate other factors (at the "why me?" level, and not at the "how" one), in which they may, or may not, strongly believe.

Besides, this "mirrors game" is played in a context of hegemony, where most of the workers implicitly accept the superiority of technological reasoning and just have fragmentary notions about the local beliefs. Therefore, to believe in the action of spirits and sorcery is embarrassing and, together with the occultation of that belief, it's not uncommon the deliberate effort to don't believe. The most common attitude, however, is not the declaration of scepticism or belief, but the discretion and, even more, the position of "open-minded doubt".

The later depends, by definition, of the occasion. As a worker said to me, *«the youngest want to despise our traditions but, sooner or later, something happens in our lives that make us take those things seriously»*. In other words, independently of their level of scepticism or doubt, the spirits/sorcery heuristic system is always available for the workers, and other people often remember it to them, on daily life; when coincidences or misfortunes happen, it is right there, ready to use in order to explain something that no other available system is able to explain: the absurdity of random events. Besides, it can provide not only an explanation, but also guidelines to correct the ultimate reasons for the undesired event.

What happens in the plant is very similar to this. Workers may use magical protective devices (because they believe, or "just in case"), they may prevent spiritual dangers by do not killing snakes (the same way as they prevent technically dangerous situations), but the local system of uncertainty interpretation stays sleeping in the background during daily work, because it's not pertinent in the current labour activities. In fact, it's not pertinent even in the course of an accident, because at that moment material reactions are required, and not the explanation of some underlying non-material causes. Only later, in the process of reintegration into the normality which follows disruptive and undesired events, will that interpretation system become pertinent and mobilised by people.

So, besides prevention actions derived from it, the logic of spirits and sorcery only emerges during the process of understanding disruptive and exceptional events. In a strict sense, it coexists beside but apart from technological rationality - which objects are, on the contrary, the normal periods and the material causal relations.

However, this specialised and complementary coexistence of two interpretation systems would not exclude, in abstract, the arising of problems for the labour quality and safety – and, in fact, part of workers' embarrassment about the belief in sorcery and spirits' action comes from the notion that, if public, it would jeopardise their image of proficiency and excellence, or even make them object of mock.

Their fear is not groundless, since the "western" ideology of management tends to consider that industrial work and *«hocus-pocus»* are incompatible. This assumption may be accurate in many cases, but not in the one we are dealing with.

First, as I just mentioned, the spirits/sorcery logic is not applied to the functioning of the machinery and the production process. As in the Mozambican interpretation system considered as a whole, that's the field of the material relations and, consequently, of the technological rationality.

Secondly, both systems demand from the workers, in fact, the same safety attitude.

As in the most up-to-date scientific perspectives, at Mozal the safety is regarded as a matter both of prevention and precaution. I mean, it is assumed that many of the harmful events can be previewed through the experience and the analyse of their material causes, and avoid trough correct proceedings. But it is as well assumed that there are so many factors involved in complex technological systems that accidents can happen due to combinations of causes which nobody could preview. So, it is demanded from the workers to prevent the risks which could be previewed, and to be ready to unexpected surprises - by giving attention to new hazards around them, by proceeding carefully in order to don't create new sources of danger, and by stopping in case of doubt.[9]

Meanwhile, the dominant Mozambican system may also include prevention (such as protective amulets, rituals, or a social behaviour in accordance with the consensual rules), but does not excludes, at all, the precaution and the proficiency. In one hand, prevention does not guarantees safety and good fortune, because even someone who would keep an exemplary behaviour towards the livings and the deceased could be the victim of envy, misunderstandings, guilt inheritance or indirect attention callings. In the other hand, as I mentioned before, only if the victim knows what he's doing and takes all due precautions, suffering nevertheless an accident, will this system explain the event trough the action of spirits and sorcery. Otherwise, it will be a matter of ignorance, incompetence or carelessness.

So, ancestors, spirits and sorcerers cannot be expected to solve one's safety problems. In short, both systems demand the workers: i) to be aware of the dangers and of the means to avoid them; ii) to follow the rules which allow them to avoid known hazards; iii) to avoid actions which might create extra dangers; iv) to be attentive to all abnormal or unusual situations, and to react carefully to them.

Therefore, those systems do not stand in opposition and no perverse effects should be expected from their coexistence. Moreover, this coexistence that we can found amongst Mozal workers is not, after all, essentially different from the case of their Brazilian colleagues who make the sign of the cross when they enter the potline or, to quote a Portuguese folk stanza, from the installation of lightning conductors on churches roofs.

"Modernisation" and "tradition" endurance

Max Gluckman suggested almost half-century ago, in his seminal essay "Study of a social situation in modern Zululand", that a group confronted simultaneously with different cultural systems does not adopt or reject each one of them as a whole (in a logic of everything or nothing), but selectively and custom by custom, according to the individual and collective advantages involved in each case. He furthermore suggested that the key variable which leads the social negotiation about the adoption, refusal or emphasis of a custom – does not matter if it is endogenous or new – is the ability this custom has to express and manage the relevant forms of conflict or cooperation, which endured or emerged on the changing social conditions.

I would say that this is usually the case, and that several aspects of the example I just presented can be interpreted under that light. However, as this example also can show, the dynamics of socio-cultural change can overflow Gluckman's suggestion in, at least, three major points.

[9] That's why each worker possesses a red card which entitles him to, on behalf of the General Manager, stop others' work or refuse orders, when he *«believes in good faith»* that they are dangerous. The analysis about if they were dangerous or not will only happen after the work stoppage.

First, the adoption of innovations is not necessarily done custom by custom, idea by idea, logic by logic. Under particular conditions and constraints, a whole system of rationality (and consequently of perception, interpretation and action towards the external reality) can be adopted. In the Mozal case, as plausibly in other modern technological contexts, this was due to hegemony processes which were already present in the outside society, to people's immersion into a micro-society and activity which required the use of the innovative rationality, and to the job rewards and punishments going together with the correct or incorrect use of that rationality.

Secondly, the social negotiation about the adoption or abandon of a custom may equate other advantages than those of economical, prestige or politic nature. The more I research this subject, the more I'm convinced that to provide a sense to uncertainty, to randomness, is an universal necessity of human societies. At least, I never heard about any society which doesn't manipulate one or several interpretation systems for that purpose, often coexisting and being selected according to each particular context and situation. From this point of view, a system which gives sense to the aleatory, when no other systems are available for that purpose, presents a plus-value which may justify its continuity and resilience, even under occasional questionings when it jeopardises other interests and needs.

Finally, we noticed that, even in a hegemonic framework and when they apparently seem to compete, old and new conceptual systems may coexist and complete each other, being used in different contexts. If we say it in a so abstract way, this sounds obvious, because every one of us can straight away remember much more examples. Nevertheless, we got the habitude of assuming that things are different when the new conceptual system is the technological rationality, and the process of its adoption is modernisation.

We could nevertheless see that, as far as the "traditional" interpretation systems of uncertainty recognise the autonomy of material causes and focus in a second level of causality (like indeed is usual in most African regions), they are not really rivals of the technological rationality, they do not jeopardise its effectiveness in its specific field, and they have an unique plus-value as sense providers.

Returning to Gluckman's inspiration, I could perhaps close this point and this presentation with a question, instead of a statement:

Even assuming a future generalisation of technological rationality, if "traditional" systems do not contradict that rationality or the phenomena it explains, and if they are useful in an unique and socially appreciated way, why should they fade away, abandoned by the people who is used to them?

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