

Medicine multiple ontologies in the pre-clinical trial of a South African indigenous medicine (*muti*)

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Two seminal articles in medical anthropology appeared in the 1980s alerting to the need to account for the multiplicity in medicine. With this concern, Charles Leslie (1980) introduced the notion of medical pluralism to account for multiple “medical systems” moving through space and time as he found them to appear in Asia and beyond. For his part, Murray Last (1981) proposed to think in broader terms of “medical culture” to grasp a particular hierarchy of both systematized and less systematized forms of knowledge with relation to medicine as they appeared through his work in Africa. A decade later, Robert Pool (1994) wrote another seminal article making a plea for the dissolution of the concept of “ethnomedical systems” which he found harmful in aims to grasp African medicine as it seemed an artefact of biomedical aetiologies of causation. More recently, Littlewood (2007) has understandably argued that the time is overdue for medical anthropology to question the concept of a medical system that underlies much work in medical anthropology, namely finding the notion to be mostly in ethnographers’ minds. I pursue in this line of concerns with a proposition for a notion of “medicine multiple” which I found useful to address plurality in medicine without assuming necessary pre-existing enclosing systems, order or coherence, even in alluding to biomedicine or globalized health knowledge and notwithstanding its pre-eminence.

First, I introduce the legacies of medical pluralism as I understand them. Second, I begin to contrast these proposals with a notion of medicine multiple which does not place the social or cultural as pre-existing, nor the mind as guiding bodily action. In this approach, I follow a good number of insights in line with Ingold (2011). I also borrow from Merleau-Pontys phenomenology of perception (1945) as well as Mol’s notion of body multiple and broader ontology of a multiple object

(2002). More importantly, the proposed notion of medicine multiple is found useful to rethink some of the undertones embedded in the notion of medical pluralism; namely its assumption of a plurality of “medical systems” or contained within “medical systems” and its corresponding agenda to compare and describe these entities. The research agenda rather proposed is to follow medicine as it is being made to appear in practice. In a third section, I define the lines I have found people and medicine to move through in the pre-clinical trial of an indigenous medicine which I followed in both sub-Saharan Africa as well as in America¹. I explain briefly how I engaged in doing medicine as a way to know it and grasp “what is going on” in making an indigenous medicine into a biopharmaceutical to counter a world tuberculosis pandemic. Opening the materiality of medicine, its practices and its organization provides an understanding of “doing medicine”. My research on the preparation to follow the gold standard to test the efficacy of “medicine” in the biological and clinical sciences, the double-blind randomized controlled trial (RCT), appears to be done through motions or lines in a meshwork (Ingold 2011: 64) which makes way for the dissolution of the concept of “medical system”. I show how a notion of medicine multiple has emerged from this study as well as how it might be applied more broadly.

Legacies of Medical Pluralism

Leslie (1980) develops a notion of medical pluralism upon a backdrop of anthropological research which has taken local medical systems as their units of observation. He thus defies a modern dream assuming all other forms of health care would «simply become extensions of a nationally and internationally-standardized medical system» (Leslie 1980: 191). To palliate thinking all medicine through this generic concept of a medical system based on a single historically recent system, one today referred to as “biomedicine” (Lock & Nguyen 2010) or “global health”, he invites to do fundamental comparative research on the pluralistic structures of medical systems. These pluralistic structures are defined as inclusive of great and little historical traditions; the three main streams of learned medical practice and theory having originated in the Chinese, South Asian and Mediterranean civilizations (Leslie 1976). It is hence the more or less structured, learned and theorized systems which are to be described in a comparative anthropological project. Medical pluralism thus seems worthy to refrain from a totalizing notion of medical system however we are left with the problem of “medical systems” as enclaves of departure. Almost simultaneously appears another seminal article addressing this very issue.

In a similar attempt to palliate to the problem of “medical systems”, Last (1981) also re-examines the notion of pluralism which seems to come with it. He suggests «that under certain conditions not-knowing or not-caring-to-know can become institutionalised as part of medical culture, and that it is inadequate then simply to claim there is still at work an unconscious system embedded, for example, in the language» (*ivi*: 387).

Last’s solution to the problems with the notion of “medical system” is to replace it with an encompassing notion of “medical culture” in which medical systems and non-systems are ranked in «a hierarchy of organisation and access to government funds» (*ivi*). This partly resolves the problem with pluralism treating “alternative systems” as isolates or even competing equals. The idea of “alternative systems” rather becomes irrelevant since, because of inequalities, traditional medicine is often not recognised even as a system and can thus become de-systematized or working in subtle ways. As such, medicine in traditional Hausa medicine is described as a «cultural camouflage, like clothing and food, that enables one to survive, preferably unnoticed, in a diverse society» (*ivi*: 389). Traditional medicine is then understood as a resultant medical sub-culture thriving as a non-system which has not withered away and even, has prospered in this form. Even, it has accentuated certain characteristics which Last sums up to: institutionalized secrecy surrounding medical matters and scepticism in which people suspect that no one really “knows”. While Last only assumes this non-system in the bottom of the hierarchy and mostly apparent in lay people’s “don’t know” attitude, he also mentions not-knowing with practitioners, even if to a lesser extent. I would however argue not-knowing is part of all people’s practices, even doctors in assumed well organized “systems”, since they are not interested in all causes of disease, nor do they care to know of the lived and felt experiences of medicine. Experts and non-experts in any medical practice also often resort to secrecy in specialized knowledge; perhaps this is also done to conceal lack of knowledge and certainty as Last assumes for de-systematized traditional medicine. In other words, Last’s critique of medical systems and pluralism seems to apply just as well to pre-eminent government funded medicine.

Littlewood’s anthology (2007) uses Last’s seminal 1981 article as a point of departure taking this discussion a step further. He asks if the assumption of a uniform and consistent “medical system” is in the minds of the community, in society as a whole or a convenient way for ethnographers to design a research agenda? Littlewood and the authors of the anthology show that all medical cultures are more or less unsystematized due to generalized “not knowing”; the “medical system” rather being in the minds of the ethnographers. Pool (1994) aimed at the dissolution of “ethnomedical systems” for this reason as well, critiquing

that it was reproducing ideas found in Western biomedical theories of causation. In the introduction to the book, Littlewood argues that anthropologists should not add coherence, or suppose pre-existing coherence, in particular with relation to health, healing and medicine. One reason not to assume pre-existent knowledge by members of social groups and their healers is that «In the extreme case, local treatments are seen as efficacious precisely because their mode of operation is mysterious or even unknown» (Littlewood 2007: ix). While I agree we should not add coherence or suppose pre-existing coherence with what people know in medicine, I disagree the “unknown” should be equated with a lack of interest with the “mode of operation”. This not only assumes there is such a thing as a “mode of operation” to unravel, yet it supposes it is the only way to know medicine and healing, such as in the lived and felt which usually constitutes sturdy knowledge. It thus disregards any other ontologies, showing why it is much more arduous in these approaches to let go of the assumption of pre-existing coherence in “biomedicine” or “global health”.

In the introduction of their tribute to Leslie’s work in medical pluralism, Lock and Nichter (2002) define the route of medical anthropology as ranging from documenting medical pluralism to critical interpretations of globalized health knowledge, policies and practices. In both cases pre-existing coherence in medical organization is taken as a point of departure. Lock and Nguyen’s more recent work *An Anthropology of Biomedicine* (2010) follows this route as well, perhaps implicitly reinforcing an idea of unity of “globalized health” under which plural “local biologies”, bodies, technologies, social relations, politics, and cultures are entangled. The interest in this biomedical umbrella becomes not only its hierarchical disposition with regards to other “traditional medical systems”, which are only slightly dealt with, but rather its internal hierarchies, such as placing the biological body above social context (Lock & Nguyen 2010) or placing biological life above social life (Fassin 2010). An effort is hence made towards adding more nuanced orders or subtleties within biomedicine, broadening concepts such as bodies or disease, somewhat including plurality within its foreseen social arrangements. Plurality is assumed as inherent to a system and something which can be critiqued as if it were an object of inquiry to begin with. In this global pluralism, very little space is allocated to “indigenous ways of healing”. When referring to “traditional medical systems” Lock and Nguyen specify that «they are neither static nor lacking in innovation» (*ivi*: 63), showing that the notion of traditional medical systems is otherwise understood as closed. While the open-endedness of “traditional medical systems” is acknowledged, these entities are however made to appear as separate from globalized

health knowledge which is implicitly considered coherent and ordered, albeit plural.

In most of the accounts described in the legacies of medical pluralism, more leeway is given to let go of the idea of “medical system” with regards to traditional medicine than in discussing the possibility of “biomedicine” also being more or less systematized. I suspect this is due the difficulty to bracket “nature” or empirical knowledge which is preferably left intact and unifying as a solid accumulation of knowledge to hold onto. I want to argue this “knowledge of the mode of operation” also needs to be bracketed, as well as the idea it is acquired through systematized knowledge of objects and mechanisms. Rather we find an open-ended “system-in-the-making” in both traditional and biomedical practices, one which is always emergent and done or undone by both human and non-human actors entangling. What is also apparent in these legacies of medical pluralism is that holding on to the notion of “system” seems to coincide with sustaining the notion of “culture”; Last for instances proposes to include “medical systems” in a broader encompassing notion of “medical culture”, Lock & Nichter and Lock & Nguyen for their parts understate systematization by labelling it respectively “globalized health” or “biomedicine” (applying culture to all social arrangements). In this way the notion of “nature” as “true empirical knowledge of the environment” is maintained on one side and “culture” on the other, leaving any other ontological organization sidelined. I want to explore how this might have to do with the notion of plural in contrast to one of “multiple”.

Exploring a Notion of Medicine Multiple

... ontology is not given in the order of things...
ontologies are brought into being, sustained or allowed
to wither away in common, day-to-day, sociomaterial
practices.

(Mol 2002: 6)

“Medicine multiple” is in part inspired from Annemarie Mol’s *The Body Multiple* (2002) or “ontology of a multiple object” which shifts the grounds for thinking about what a medical object is and also what a medical practice is; the object itself is not assumed as unified. I have however not begun my research with Mol’s notion of “multiple”; I have ended up there and through a very different trajectory. Mol has explored practices in a hospital in the Netherlands to grasp how bodies are being done; further she centers on doing disease, more specifically arteriosclerosis.

I have explored practices in both controlled laboratory settings and, most of all, in the “open air” in sub-Saharan Africa, centering on doing medicine in a setting where South African Indigenous Medicine (*muti*) is alive and well, as well as being tested (in part) for its efficacy in becoming a biopharmaceutical against a world tuberculosis pandemic. It is how medicine is made and handled in practice which I follow; how humans engage and entangle in medicine. In a similar approach as proposed by Mol, bodies according to Haraway (1993: 372), «are not born: they are made»; they are “material-semiotic generative nodes”. Their boundaries materialize in social interaction: «objects like bodies do not pre-exist as such» (*ivi*: 375). As with bodies, I contend that medicine does not exist in and of itself but is only made to appear as such in relation to multiple situated practices in the inhabited world. Medicine, in both its “thinginess” and relations with humans is thus continuously being “done”, or “made” into something that counters a particular physiological process, heals or enhances healing possibilities in one way or another. Medicine is always constituted and re-constituted through emerging engagements in the medium or world. It is these practices which I have followed and which lead to the problems I foresee with medical pluralism and the solutions I find with medicine multiple.

Plural and multiple both imply “more than one” however the first implies “containing more than one” while the second refers to the “involvement of more than one”. The nuance is subtle yet with important implications. Medical pluralism can allude to a “theory that reality is composed of a plurality of entities” such as medical systems as discussed above. It implies more than one kind of something contained in something else. “Multiple” rather alludes to the manifold, something in common, collaborative, and conjoint. It points to the ways things are made to hang together or interweave. Medicine multiple thus does not pertain to a pre-existing system or ontology yet is part of making practices cohere (or not), always emerging, not confined nor contained yet brought into being, sustained or left to wither away in relation to the lived environment. In discussing what of medical pluralism might be left to wither away, I thus suggest it is the very term “plural” to which I propose “multiple” precisely to let go of the assumed “container” or “confinement” of this multiplicity, whether named “global”, “system” or even “culture”, as if these entities exist to begin with. While this has been done more easily with regards to “traditional medical systems” as mentioned above, and most likely since it did not apply in the first place, the notion of medicine multiple seems to be useful to do so as well with regards to “biomedicine” and “global health”. Rather, these enclosures may be brought into being (or not) in manifold ways, engagements of people and things in the world always

emerging, being done and undone, both informing and informed by ontologies. Ontologies may be written, formally designed, legislative and felt as a constraint or as part of a system and matched as best as possible in practice to fit this organization, yet the assumed order is rather always being done or undone in new ways. Even a well-designed model such as the RCT does not provide sufficient guidance to be able to proceed in practice, especially when it is offshored to new contexts where it is more arduous to go about it as “routine business”. Further, it is not reproducing the model to the letter which makes it work yet rather finding ways for the categories of existence to work in practice. These engagements are not pre-programmed yet are learned through doing, attuning ones attention in the world or what Ingold (2000) proposes we name “skills”.

This approach reverses some of the assumed hierarchies of knowledge as well as does not leave empirical knowledge intact; it is precisely the equation of knowledge with a demonstration of the “mode of operation” which needs to be dislodged to let go of the assumed unified coherence in global health. Numerous anthropologists have opened the notions of disease, body, efficacy to account for plural forms of medical systems or organizations however always keeping with an overarching agreement upon a modernist project placing cultural diversity on a background of natural universality; a backdrop of One Nature (container of plural objects or entites) in which diverse cultures play themselves out (smaller plural containers). Descola (2005) has named this ontology “naturalist”; namely Western thought, or science in its broad dominant positivist stance equating knowledge with empirical knowledge of “nature” as opposed to “culture”.

The point of this seemingly innocent divide is that it is a formidable political ploy. The common world (of what the universe is really made up) is known by the scientists, but invisible to the eyes of the common people. While what is visible, lived, felt, is, to be sure, subjectively essential but utterly inessential, since it is not how the universe is made up. This means that when the time comes to tackle the political work par excellence, namely the definition of what sort of world we have in common, scientists can say that the task is already completed since the primary qualities are all summed up in one Nature (Latour 2000: 118).

It is the parts of Nature which are primary in a notion of medical pluralism (atoms, drugs, disease, systems, even if made open-ended and broader to encompass plural forms) while it is the lived and the felt in the world which become primary in a notion of medicine multiple, or at least entangled in nature, both informed and informing its common becoming. RCTs are one example of making medicine “biomedically” or a model designed in assuming the primary qualities of the common world

are summed up in one Nature while what is visible, lived, felt can fall into “culture” and more precisely into a category known as “placebo effect”. This ontological divide is however blurred in the case of the trial of an indigenous medicine which simultaneously announces collaboration with healers, recognition of and respect of indigenous knowledge. RCTs are science’s primary route followed to provide empirical knowledge of a part of “nature” for assumed universal biological bodies regardless of context (or solely in a controlled environment), a path generally assumed as needed to fit global health networks. Following a pre-designed model is thus a process of closure to indigenous medicine rather than one of recognition, making it conflict with its own double objective to simultaneously isolate a molecule and recognize the dignity of a people. How this is made to cohere in practices become of utmost interest for anthropological inquiry. Attending to multiplicity in the pre-clinical practices of an indigenous medicine has led to open the black box of both “nature” and “culture” as neither ontological category exists in *muti*, nor are these brought into being in a same way by all scientists. Empirical knowledge in a controlled environment is thus entangled in life in the “open air” in making objects rather than revealing the properties of objects existing *a priori*.

To move away from an idea of a pre-existing order or system of medicine further requires a novel notion of perception. Perception in medical pluralism agrees with the dominant empirical stance which assumes information received in the mind guides bodily action; with the notion of medicine multiple I propose this order of abstraction is dissolved, rather assuming mind and body are in continuous entanglements in their engagements in the world. In the latter notion of perception there are no longer objects and mental programs preceding action; these are continuously being done through new involvements in the world. As such, I follow the phenomenology of perception proposed by Merleau-Ponty which does not place thought as hierarchically primary to enactment as in most scientific experiments, including the RCT. I thus lean towards Merleau-Ponty in his idea of continuous entanglements between seeing and moving (1945); prior experiences of seeing or knowing are always fed back through movement making it so that we are always engaging in the world or medium in new ways. Assuming that previous experience is in constant entanglement with the ways the world is perceived (and in reaction with) in the moment makes it so that such an experiment to test a “thing” upon an otherwise perceived “passive” human (or “intact” cell) no longer holds as the sole necessary path towards “truth” of the “efficacy” of an isolated bioactive compound in this case. This phenomenological stance in anthropology is deemed more appropriate as it enables to account for both the empirical and lived bodily experiences

in following the ways ontologies are brought into being in practice. It is in dealing with the entanglements of people and things in both natures and cultures that I situate a notion of medicine multiple, a notion enabling to attend to these intricacies without the necessity to assume pre-existing objects or pre-existing systems to describe. As such I agree with Ingold (2011: 14) stating that our task is not to take stock of the content of entities yet it is rather to «follow what is going on, tracing the multiple trails of becoming, wherever they lead». It is my latest fieldwork following the making of a biopharmaceutical from Indigenous Medicine in South Africa (muti) and in the USA (2006-2010) which leads me into this approach as well as to find a notion of medicine multiple to best correspond to “what is going on”.

The pre-clinical trial of an indigenous medicine

The pre-clinical trial² I followed is an African-American initiative entirely financed by the National Center for Complementary and Alternative Medicine (NCCAM) branch of the NIH in Washington DC (USA). The research consortium undertaking the pre-clinical trial, The International Center for Indigenous Phytotherapy Studies (TICIPS- pronounced tea-sips), unites scientists from both the US and South Africa. It is a 4 million USD initiative beginning in 2005 for 4 years and taking place mostly in Cape Town, South Africa where both the indigenous plant and the high occurrence of tuberculosis is found. It takes place in high tech university laboratories in both the USA (Missouri and Texas) and in South Africa (Cape Town and Durban) as well as in farms, townships, mountains, valleys, offices, meeting and conferences rooms. On trial is the South African indigenous medicine named Umhlonyane in Xhosa (Wilde-als in Afrikaans, Wild Wormwood or in Latin *Artemisia afra* (Jacqu. Ex. Wild) for its efficacy with regards to controlling mycobacterium tuberculosis (MNTB). This is the plant being prepared to undertake a RCT. The RCT is a methodology of choice and legislative measure to approve of the efficacy of medicines, or «shed light on mechanisms of action of a therapeutic modality» (Lock & Nichter 2002: 20). It constitutes clinical research evaluating health-related interventions on health outcomes. RCTs are perhaps the most regulated type of research with the most specific guidelines in ethical policy statements worldwide.

Following such a design may thus be assumed as a straight forward practice. The pre-clinical trial is however filled with ontological innovation, some ontologies of the RCT design being brought into being, others left to wither away and still others modified to fit newly found hopes and contexts. The RCT as a procedure designed to produce generalized

knowledge that is universally valid irrespective of people involved or contexts and simultaneously a pathway to recognize the knowledge and dignity of a people is challenging. How this is made to cohere (or not), how medical histories, ontologies and presents made to appear and disappear in the process of making medicine become of utmost interest. Muti is a combination of diverse practices and ontologies which have persisted and even thrived together with biomedical practices which, in the case of South Africa, were clearly a legal measure enforced to establish colonial power. The process of making an indigenous medicine into a biopharmaceutical is thus highly politically tainted. It is further innovative rather than systematic, appearing as lines and motions in a meshwork to the image provided by Ingold (2011). While I have no pretense to universality in this explanation, I extrapolate from this specific research in teasing out a notion of medicine multiple. The process of preparing the RCT is the example of making medicine from which I extrapolate; one which aims to recognize an indigenous medicine while isolating a molecule.

I came upon RCTs as a topic of study during research in indigenous and humanitarian medicine in the Brazilian amazon in 1992. It took me over a decade to realize how indigenous medicine and biopharmaceuticals were entangled yet had been brought in opposition to one another in terms of legitimacy, biotechnologically produced medicine gaining rapidly in knowledge/power where it was introduced. I turned towards understanding the process of making biopharmaceuticals in 2002, all fingers pointing towards RCTs as the place where “truth” about the efficacy of medicine was determined. When I began this specific research in 2006, I was welcomed as an anthropologist to contribute to ongoing debates between healers and scientists with regards to how to determine “efficacy” of a medicine. There initially appeared to be little to discuss since the RCT design explicitly sets closure to all assessments of efficacy other than «the extent to which the physiological component adds significantly to the psychological component» (Lock & Nichter 2002). This exposes the remnants, however sturdy and still brought into being, of a modernist mechanistic Cartesian philosophy separating body from mind, as well as natural from cultural, or physiological from psychological. Simply adding “thought”, cultural or psychological components to the physiological ones does not suffice to enter into any real discussion. Working with indigenous medicine however quickly leads to mend mind and body together since their efficacy is known “in life” or in the “open air” rather than in controlled laboratories. The scientific actors implicated within the preclinical process (molecular biologists, immunologists, pharmacologists, plant systematists) give reality to the pre-clinical procedure by partaking to cow ceremonies with the healers for instance, paying attention to

how the medicine is prepared by the healers, how it is preferred in the everyday, all elements feeding into the clinical process. Foregrounding these emerging entanglements between people and medicine makes the pre-clinical practices appear as multiple rather than stemming solely from the pre-designed RCT model. Further, it is through this approach that both Xhosa isangomas' (healer diviners) and scientists' engagements with medicine can be grasped.

As mentioned above, this approach implies understanding perception in a particular way; not with an empirical stance supposing a body awaiting stimuli as in the experiment, yet as a body in continuous engagement in the world, hence implying multiple possible outcomes even with an assumed same input; further, this input is not set in closure as it is also always emerging in new ways in relation with the world, even in a maximally controlled environment. As the world, we are in perpetual becoming: «submerged in sound and rapt in feeling, the sentient body, at once both perceiver and producer, traces the paths of the world's becoming in the very course of contributing to its ongoing renewal» (Ingold 2011: 12). Xhosa isangomas' expertise is precisely oriented towards maximising this movement of opening of the body-in-the-environment; ridding themselves of all forms of standardization, including language, repetitive rhythms, dance, sounds, glosollalia (speaking in tongues) aim to reach a pre-ontological state and bring the patient into this state as well as a means to bring him back in order within the world. I've elsewhere named this process a «standard to avoid standardization» (Laplante, forthcoming), which seems to correspond to what has been stated in ritual theory since Turner's early works; procedures aiming to reach a state of «homogeneous social matter» so that they can be remade into a new, better, form (Turner 1977: 37, in Agic 2012: 146). Csordas (1990) also puts forth a similar approach mixing Merleau-Ponty's phenomenology of perception and Bourdieu's theory of practice to account for embodiment in the performance of healing in both healers and participants as "knowledge". The art of healing is one of mastery of rearranging relations between things and people in the inhabited world. According to Stroeken (2008: 467), «healers have a knack for further codification of the senses [...]». They would operate on a synaesthetics «that couples fairly discrete semantic codes with specific bodily sensations» and «a patient's insertion into healer's particular synesthetic of turning meaning into matter is part of the healing processes». This "pre-objective" state is prized by the healers who work closely and explicitly with indeterminacies and connectivities within the world.

While performances are done in a somewhat orderly pre-fashioned manner, these are left open to improvisation, even prizing the unexpected

rather than aiming to control and demonstrate a fixed cause and effect from an externalised positioning. Doing an RCT aims to follow pre-established designs while Xhosa healing aims to break down current designs in a similar quest for efficacy. They do so through establishing relations in medicine as a medium of communication rather than through making medicine into a commodity containing health in itself. Following *A.afra* with these actors led to taste its bitterness, smell its uplifting pungent, sweet scent, collect its soft textured leaves, listen to its movement in the wind, see where it likes to grow “wild” and how it is tamed in a township backyard, collected in the mountain valleys and sold in herbalist’s stalls in the market, prepared to alleviate a baby’s fever; in other words feel the plant, people and place in similar ways as healers did. Upon assisting a drum session and healer’s initiation, it became clear that this was how knowledge with plants was being made; by developing skills to enhance engagements “in the inhabited world” rather than in isolation from the former. Sounds were the main entry point to acquire skills as well as heal, and sound is a ‘phenomenon of experience – that is, of our immersion in, and commingling with, the world in which we find ourselves’ (Ingold 2011: 137). According to Schutz, «data collection by an anthropologist in a fieldwork situation is a phenomenological exercise» (1967, in Prattis 1982: 205) or learning through experiencing the world. This is what I was invited to do when I asked a Xhosa isangoma «how does *A.afra* work?»; I was invited to be immersed in the world, in the experience of life through drum sounds. To obtain answers to my question, it had to become «how does *A.afra* work in the inhabited world?». Experiencing indigenous medicine was more than about the medicine per se and the latter often disappeared from sight such as under the bed sheets to “purify” the person to be healed the next day, often also losing its “thingness” and activated at a distance. I have thus found “medicine” not to be an object or fixed entity, yet rather ways humans entangle with materialities, “medicine itself” appearing as manifold.

Following *A.afra* anthropologically meant to embed myself where it led me. It also led me into various clinical settings, laboratories, offices, meetings where the actors could provide visual representations of how *A.afra* “worked” on computer screens, in drawings, through laboratory techniques, also involving my senses, more intensively my intellect and vision; a particular kind of representational vision as refined in science, the Yolmo in Tibet having attested to 27 in Desjarlais’ (2003) work, showing how sensitivities can become rather sophisticated. I also attempted to sense what it felt like to move through these spaces to grasp how *A.afra* needed to work to fit a RCT; hence also adding the world, one which is at the same time controlled and enclosed as well as transnational and multi-sited. Adding the involvement

of “this world” to my question may seem mischievous as the RCT is a process explicitly undertaken to withdraw from the world, or at least away from culture, psychology, smell, taste, touch or other aspects of life difficult to objectify and make travel through a claim of objectivity. These broader elements of life in context are of course omnipresent throughout the process, although less tailored since considered irrelevant, even harmful or as bias for the preparation of the RCT by some of the key actors directly partaking to the trial. This has to do with the “nature” of the experiment which in this case might otherwise invite to include sounds to grasp indigenous medicine in any meaningful way (see Laplante 2009). As such, Gouk (2005) explains how a shift of paradigm from “nature as musical” to “music is natural” was necessary to create the possibility to test the effects of music on humans;

It was only after Newton succeeded in unifying the mathematical principles that underlay manifest mechanical actions and occult attractive forces in his new physics that the paradigm became ‘music is natural’ and its effects on human nature became amenable to medical and scientific experiment (*ivi*: 104),

a paradigmatic shift that would have occurred between the 15th and 18th century. As with music made natural, such is the case with medicine. In making medicine “natural” and separating it from humans, it becomes possible to test its effects on humans. In understanding humans and medicines as separate entities, it is only the effect of the medicine upon human physiological processes which is of interest in a RCT; the effects of humans on medicine are of no interest, nor the relations of humans with medicine. In fact all efforts are made to eliminate the latter effects; the vacuum sealed laboratories, gloves and garments, machinery, computers and most of all following a strict well designed model are meant to prevent leaving traces of the researcher’s presence.

The main paradox in this design is not only that it cannot grasp indigenous medicine as announced, yet it is also the extreme transformation the medicine goes through in the hands of laboratory scientists yet the remaining conviction that the procedures are not affected by humans nor affecting the nature of the plant, but only revealing its efficacy or “mode of operation”. However, «what we observe is not nature itself, but nature exposed to our method of questioning» (Heisenberg 1971, in Capra 1999: 40). The RCT is a highly deductive research process, a model and theory in search for data. Its results tell more about the model and the humans behind it than about how a medicine is useful in the world. What it tells us about the humans behind the models is that they are ever-present yet not wanting to be there, trying to stay as far and distant as possible from the “object” of study. Scientists learn to disengage with both medicine and people to treat within the experiment; this externalisation from the world

to “know it” empirically accompanying the ways of doing science since the dawn of enlightenment make for particular ways of making medicine. The procedures of the pre-clinical trial followed with this inclination tend to create new entities of being produced biotechnologically in controlled environments as well as create new ways of being in the world. As with the patients who will become silent objectified bodies for a while, objectifying the plant and deadening the world around it are at odds with the indigenous healer’s ways of knowing in the world.

Perhaps the most mutilating aspect of preparing an indigenous medicine for a RCT is when the healer’s presence is also meant to leave no trace since this is where “knowing” stands. The dominant positivist scientific stance of objectivity or distance from the medicine being studied thus diminishes possibilities of engaging with indigenous experts. Blinding both taker and giver of the medicine to eliminate the “placebo effects”, essentially any relational effect in the ways of administering the trialed medicine, are explicit acts of dismissing the world, the senses, the “sum” of Descartes’ *cogito*. When RCTs are offshored with the explicit objective of learning about that new context in the sense of wanting to learn about its medicine, RCTs appear too rigid to grasp anything but what fits this way of organizing, or rather dividing the world; in the end, RCTs grasp no more than an extract of plant. The ontologies of nature (here the effect of a medicine on a physiological process) to be observed and represented on the one side, and culture (everything else) to be disregarded on the other, are deeply entrenched in the RCT and are difficult to allow to wither away by some of the leading actors. This appears to be what is also held onto in a notion of medical pluralism.

This way of dividing the world as currently set by RCT protocols, and enacted by the actors partaking to the trial, often to their dismay, is what sets the healers apart. New actors introduced in the RCT have historically always had to struggle to fit into the process; statisticians were not welcome in this process in the 1950’s while they have now become one of the most indispensable actors. This is when the doctor’s experiential knowledge was definitely set aside and patients lost most of their agency (Marks 1997: 187): «the superiority of ‘objective’ measures displaced themselves from evaluations anchored in the incorporated abilities of the practitioner towards the clinical status of patients (such as laboratory tests results)» (Marks 1987, in Löwy 2000: 50). It’s somewhat this very struggle that re-emerges in the encounter with Xhosa isangomas. Healers are accessory in the process of the RCT other than to provide hints as to what molecular configuration to look at in the plant and, perhaps most of all, to insure compliance to the trial by local participants who trust them. In a certain manner, indigenous healers become a form of technology that

enhances scientists' powers to reach the desired goals of accessing the right molecules in the right plants; healers becoming providers of the data of departure towards scientific innovation. Other scientists are however "indigenously inclined" and their hopes in the RCT are rather to achieve indigenous dignity through these same practices, hence pulling towards maximising "life" in muti or bringing contextual histories and presents into being. The push and pull makes the pre-clinical trial politically filled with conflicting ontologies bringing issues of knowledge legitimacies in tension.

The issue of trust is omnipresent throughout the pre-clinical process led in the aftermaths of South African histories of apartheid. South African students in herbology at the University of Western Cape who were asked why they were testing plants in laboratory procedures if they already knew those plants "worked" answered that it was because «they don't trust us». When I accompanied a group of healers to a visit at Delft laboratory of the Indigenous Knowledge Systems Branch of Cape Town's Medical Research Council, we were exposed to the diverse rooms, technologies and procedures to transform a plant into powders, capsules and pills and I overheard someone exclaim: «they have been hiding all of this from us!». Suspicion, hope and disappointment taint the practices in the pre-clinical trial. The greatest common disappointment for the healers is that their ways of knowing and making the medicine "work" are mostly dismissed in these practices. Walking outside the laboratory where we could see the Vervet monkeys in outdoor cages, one of the healers was overtly astonished to learn of the "verification" of their medicine in animals, notwithstanding animals in cages. She was completely thrown off as what she knew of the medicine was in relation with people in the world. Testing on animals in cages would for her only serve to afterwards treat animals in cages, limiting the scope of its usefulness.

Healers and scientists diverge at the onset of the preparation of the trial, the first not bringing into being the latter's ontological divide between nature and culture. To prepare for the trial, *A.afra* needs to be prepared into a constant dosage. The particularly high variability of *A.afra* was and remains a great challenge for the RCT. Growing it on 2 different farms had to be narrowed down to a single farm and farmer since both the different micro-climates and the particular way the two farmers nursed the plants created too much variability. The healers however refuse the *A.afra* growing on the farm chosen for the trial. Through this strictly controlled human manipulation, the plant is said to lose its "life" or efficacy. Xhosa isangomas rely upon Rastafarian bush doctors or *inyangas* (herbalists) to obtain their medicinal plants because they share with them an understanding of the world as a sentient being;

plantations and cultivated lands are not neutral grounds even in the post-apartheid context. Other ways of tending to plants are also found disturbing for the healers; a molecular biologist explained how a healer visiting his laboratory had commented about a plant growing in a pot that it appeared to be “choking”. When the world is given agency, the ways of interacting with it become crucial, control and manipulation at a distance becoming less acceptable. This explains why proximity with the plant was always mentioned as a source of knowledge legitimacy, whether the plant be grown in the yard, dried and kept in the house or known to grow in this or that area. I accompanied numerous Rastafarian inyangas to collect plants that were deemed legitimate by the Xhosa isangoms. The way of collecting the plants in specific sites and relations were primordial. The main problem confronted was finding these locations as they disappear under private property laws and areas of nature conservation which also agree with possibilities of taking the world apart into lots, as well as excluding humans from the environment to conserve. The risk of getting caught collecting herbs in these locations was convincingly overridden by the felt connection with them. Like the variability valued in the plant, the healers also cherish proximity and entanglements with the particular therapeutic problem to deal with. In either case it is through deepened engagements in the world and things that problems are resolved, posing numerous challenges to the RCT standard.

Standardization in the RCT’s formal ontology is also continuously challenged by the actors officially enacting its practices. A molecular biologist explained how his close interactions with healers play an important role in his selection of a particular molecular configuration of the plant to look at, even if this is quarantined in the results he will provide. Another molecular biologist, the South African director of the pre-clinical trial, enforced the need for the trial to remain embedded in the world during its process, disagreeing with its current closure in the image of a pipeline with light only at the end of the tunnel (this image is often used to illustrate the current “pharmaceutical pipeline”). Instead of the RCT he proposes a reversed pharmacology model; a model borrowed from Patwardhan and Mashelkar (2009) to test the efficacy of Indian Ayurvedic medicine. The model essentially proposes to reverse the routine from «laboratory towards clinic» to «clinic towards laboratory» (Patwardhan & Mashelkar 2009: 806) hoping that more of indigenous knowledge could enter the clinic and filter through what it will be narrowed down to in laboratory studies. Indigenous medicine is also brought into conversation with scientific innovation, stating that «indigenous knowledge systems are in avant-garde of the popular idea that the drugs of the future would be highly personalized and specific to the needs of individuals» (Johnson

2011). Indigenous medicine is thus transformed into new forms of medicine at the cutting edge of biopharmaceutical, bio-informational, biomolecular, biotechnological, and biomedical innovation. In 2011, TICIPS consortium was newly renamed The International Center for Innovation Partnership in Science (TICIPS), leaving the “indigenous” connotation found the original appellation to wither away; a move described as one from translation of Indigenous Knowledge Systems to innovation for the bioeconomy (Ibidem). Perhaps this will avoid the problem of otherwise recognizing indigenous medicine in a politics of exclusion as an isolate enclave, or it will be made to simply appear as “science”.

Most scientists involved in the pre-clinical trial felt the RCT as a constraint of bureaucratic procedures, simple manoeuvres such as including a bus for transportation to a clinic mentioned as an issue if it were not part of the design. Such logistical contextual issues were bypassed administratively by simply “dealing with it”, as is done with what is learned in indigenous medicine which would otherwise demand the ethical approval of a new design. Other aspects learned in context are however included in the procedures, usually in the following research, such as pharmacologists’ preparing *A.afra* for testing in the form of tea bags as found to be the most common practice in the everyday. For yet others, context filtered into their ways of understanding, an immunologist for instance explaining the immune system as everywhere and nowhere, “something like life itself” as I’ve heard healers also mention. He further explained tuberculosis as having a rather long history of interaction with humans over many generations, greatly transforming itself as well as humans in the process. This perhaps unconventional opening of research, the body and disease in the inhabited world will be quarantined in the RCT results; however it appears in conversations as well as in practice.

Ontologies brought into being differ with regards to the various scientific experts and disciplines involved in the pre-clinical trial and there are internal struggles of legitimacy, some finding more stable grounds to stand on for a while as is currently the case with molecular biologists, yet all rely on each other’s results to make the trial credible to another series of actors from ethical and legal domains. Since indigenous medicine is involved there is perhaps more overlapping of medical practices, genres, negotiated performances, pushing the limits as well as the meaningfulness of the process of making medicine in *muti*. In this briefly sketched scenario dealt with in detail elsewhere (Laplane, forthcoming), ontologies are informed by as well as informing the actors in ways that fit the context at hand as well as the one imagined beyond its locality. A biopharmaceutical made from indigenous medicine should (for some more than others)

maintain its roots (South African for some, Xhosa for others) in the process of making it as well as were it to travel.

Conclusion

Following actors moving through the preparation of a RCT from the NIH in Washington DC, to laboratories in the US and in South Africa, to farms, mountain valleys and townships in Cape Town, aiming to grasp how an indigenous plant is made into a biopharmaceutical innovation is following lines or trails of becoming. Multiplicity lies not between finite organized systems or ways “knowing” pre-existing objects yet in the ways of doing and undoing medicine in more or less organized ways. The distinction between “medicine multiple” and “medical pluralism” thus lies in a distinction between practices enacted in the everyday which transform both the materialities and the people engaging in making medicine and assumed pre-existing enclaves. The “multiple” refers to engagements in the world which continuously make and remake the social/cultural/natural. A phenomenological theory of perception of bodies and mind in continuous entanglements as proposed by Merleau-Ponty (1945) appears a useful approach to follow “what is going on”. In this way a level of abstraction is dissolved; one which assumes ways of engaging in the world are pre-programmed through information provided to the mind in an otherwise passive body awaiting such stimuli to act and re-act. This empirical theory of perception upon which the experiment rests rather appears as ontologically unique as well as not entirely brought into being in practice.

In the pre-clinical encounter with indigenous medicine, ontologies of the RCT are negotiated in practice, at least for a brief moment, before they are closed again to fit the RCT protocols. A rigid proceeding of the RCT is otherwise incapable of understanding indigenous medicine, or any form of grounded experiential knowledge for that matter, as it is designed as a process of closure to the world other than the made controlled laboratory environment. This orients how the indigenous medicine is to be prepared for the RCT however the former is made a sentient being embedded in a shared medium or world in *muti*. These diverging ontologies brought into being in the pre-clinical process both need to be accounted for whether they disappear in the RCT results (or not), especially when the RCT is announced as a process of recognition of indigenous medicine as is the case here as well as in other clinical trials of indigenous medicine which are increasing in number across the world. How ontologies are made to cohere in making medicine through these initiatives become of utmost interest to follow in practice. Following how ontologies are made to appear

in practice rather than as something already there awaiting description invites to foreground practices rather than objects. Such a positioning dislodges both the idea of pre-existing order as well as objects and rather opens the way to grasp practices as always emerging. I followed doing medicine in multiple settings with a particular interest in how aiming to do so in a biopharmaceutical form was made to cohere with *muti* (or not). It is within this context that I have not found ontologies solely to dictate practices yet have also found them to be dictated by practices embedded in the world. This ontology of a multiple object shifts the research agenda for anthropology from the description of ontologies to how these are made to appear and in which compositions. The particular composition found in sub Saharan Africa led me to a notion of medicine multiple.

I have found medicine to be multiple in a number of ways, entangling with humans in a variety of ways which are not pre-orchestrated yet which are innovative and inventive. Innovation for some of the actors is in breaking a plant into new particles and parts in a controlled environment assuming universal biological bodies upon which it can be tested, while for others it is in enhancing possibilities in deepened entanglements with medicine and bodies to be done in the world. The medicine being done by scientists' aims to fit a pre-existing model, yet does so in innovative ways. Medicine being done by healers aims to heal bodies in the world and is also done in innovative ways. At the intersections, a number of actors aim to fit the RCT model while enhancing dignity of a people in recognizing indigenous medicine, again creating a space for innovation, perhaps the greatest one as it is mixing hopes and procedures in new ways. The actors implicated in the pre-clinical practices followed bring into being particular ontologies, models of "truth", standards, codes, categories of disease, notions of life, body, as well as legalities, politics and economics. The categories of existence carried through the RCT model as it travels and unravels are innovative. This finding may largely be related to my research unrolling in the process of science being made in a context embedded in live *muti* which does not dissociate mind from body nor nature from culture, but as such it might indicate ways forward.

Interweaved in meshworks are hence not more and less systematized medical cultures or systems yet people and things cohering into a project mixing hopes, facts, poetry, indigeneity and science in the world, making medicine in always newly emerging ways. A research agenda for anthropology becomes not documenting more or less authentic and organized medical systems yet to trace the ways these are continuously being made in practice, bringing some ontologies into being, leaving others to wither away as well as innovating ways of interweaving ontologies together. In the study of the preparation to undergo a sturdy scientific gold

standard to test the efficacy of a medicine it is the situated context and the actors which define how it takes place; namely how legislative and ethical measures will be dealt with (or not), how indigeneity is brought into the practices (or not), how the RCT model is executed, refined or modified and most of all perhaps, what is felt and lived moving in these spaces. What will be carried forward with *A.afra* should it become a biopharmaceutical can unravel in a number of ways. In other such instances of testing an indigenous medicine clinically, the indigenous connotation has been left to wither away (see Adams 2002) yet re-emerges in new ways. Medicine multiple may trace these trails of becoming to understand practices in doing medicine, immersed in the world in an ingoldian sense (2011). The proposal is to follow things and people as they «hang together somehow» (Mol 2002: 5), to engage in medicine as it is being made, done, undone, consumed, felt, sensed and experienced. More layers, lines, motions we can learn of people's entanglements in medicine, more we might also learn about being healthy, alive and well in the inhabited world. My proposal to adopt an open-ended notion of medicine multiple is an attempt to move in this direction. It can also be read as a proposal to bring a new open-ended notion of "system" to the one currently haunting the concept of medical pluralism.

Notes

1. Project entitled South African Roots Towards Global Knowledge and part of the Biomedicine in Africa Group at the Max Planck Institute for social anthropology in Halle/Saale, Germany (2006-2012). I thank this institute for its financial support throughout the research, as well as the host University of the Western Cape in Bellville, South Africa who welcomed me into the confines of the pre-clinical trial led by The International Center for Indigenous Phytotherapy Studies (TICIPS). Finally, I thank three very meticulous peer reviewers for their truly useful comments to make this chapter sturdier.

2. The pre-clinical phase focuses on preparing an ingredient (a plant or a non-plant based) for further testing in a clinical trial, usually a RCT. What is being prepared is a way to bring the most promising components of the plant into a new controlled environment. This begins with the isolation and identification of a bioactive compound in the plant according to previously published scholarly articles and information gathered in herbariums. From this step follows controlled cultivation of the plant in order to produce batches of the plant experimented with to be as biochemically homogenous as possible. Finding a precise method to prepare *A.afra* is another important aspect of the pre-clinical phase. Precise methods of extraction of the plant are needed to measure the dosage and test its toxicity, which is also part of the pre-clinical study. Pre-clinical studies are conducted either in vitro or in vivo on animals to determine that the drug is "safe". Once a "safe" dosage has been established, the plant can then be tested on human cells. Should it demonstrate a beneficial effect on the disease it aims to counter then the first phase of an RCT can be undertaken. The RCT counts 4 standard phases.

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Abstract

Anthropologists have been questioning the concept of “medical system” that underlies much work in medical anthropology since the 1980s. Following up on this concern, I propose a notion of “medicine multiple” which I found useful to address plurality in medicine without assuming necessary pre-existing enclosing systems, order or coherence, even in alluding to biomedicine or globalized health knowledge and notwithstanding its pre-eminence. First, I introduce some of the legacies of medical pluralism. Second, I contrast these proposals with a notion of medicine multiple which does not place the social or cultural as pre-existing, nor the mind as guiding bodily action. In this approach I follow a good number of insights from Ingold’s lines and meshworks (2011). I also borrow from Merleau-Ponty’s phenomenology of perception (1945) as well as Mol’s notion of body multiple and broader ontology of a multiple object (2002). In a third section, I define the lines I’ve found people and medicine to move through in the pre-clinical trial of an indigenous medicine as part of fieldwork done in both South Africa as well as in America. I show how a notion of medicine multiple has emerged from this study as well as how it might be applied more broadly.

Key words: medicine multiple, preclinical trial, indigenous medicine, South Africa, ontology.

Riassunto

Gli antropologi hanno messo in discussione il concetto di “pluralismo medico”, che è alla base fin dagli anni Ottanta di molti lavori di antropologia medica. Seguendo questa linea, l'autore propone la nozione di “medicina multipla” che trova utile per affrontare la pluralità in medicina senza dover necessariamente presupporre dei preesistenti sistemi chiusi, ordine e coerenza, anche alludendo alla biomedica e alla conoscenza medica globalizzata, e nonostante la preminenza di quest’ultima. Inizialmente vengono discussi alcuni lasciti del concetto di pluralismo medico. In secondo luogo, l'autore mette in luce le differenze tra tali lasciti e la nozione di “medicina multipla”, che non pone il sociale o il culturale come preesistenti, né la mente come guida dell’azione corporea. In tale approccio l'autore segue una serie di intuizioni del lavoro di Ingold, quali i concetti di lines e meshwork (2011). Allo stesso tempo si rifà alla fenomenologia della percezione di Merleau-Ponty (1945), così come alla nozione di corpo multiplo e a una più ampia ontologia dell’oggetto multiplo di Mol (2002). Infine, l'autore, attraverso i dati del suo lavoro sul campo in Sud Africa e in America, definisce le lines utilizzate da individui e medicine muovendosi nei test pre-clinici di una terapia africana. In tal modo l'autore mostra come da questo lavoro emerga la nozione di “medicina multipla” e come essa possa essere applicata in maniera più ampia.

Parole chiave: medicina multipla, test pre-clinici, medicina indigena, Sud Africa, ontologia.

