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A Post-Structuralist View of Evidence-Based Medicine (EBM)

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1. Introduction

Evidence-based medicine has been *praised* for its enormous contribution to information processing, and for other achievements. Most of the *criticism* has been directed at its conceptual structure. This criticism has been levelled by philosophers and doctors, such as Miles, Loughlin and Polychronis. My own approach is to develop a viewpoint on EBM from post-structuralism. I have drawn on the work of Foucault, Deleuze and Guattari, *a celebration of smooth space and nomadic science*. In this chapter I place the doctor with the patient and her problems in smooth space, detour into the striated space of the medical (EBM) gaze, then back into the smooth space of the patient and her problems. I explain "smooth space", "striated space" along with the related concepts of "nomadic science" and "State science", and I explain the "medical gaze" which I update to the "EBM gaze."

1.1 Striated space and smooth space

Deleuze and Guattari provide an account of their division of the universe into the smooth space of the nomad, the war machine and nomadic science, and the striated space instituted by the State apparatus. What might appear a straightforward division quickly reveals a number of complexities. Smooth space and striated space are mixed together and have a moving borderline. The desert becomes mapped, and a city in a declining empire drifts into desert. This transfer from smooth to striated space is a different movement from the transfer from striated to smooth space. By now we can picture a *de jure* distinction between smooth and striated spaces, and a *de facto* distinction. The former is abstract. In characterising the two kinds of space, Deleuze and Guattari explain that we occupy smooth space without counting. By contrast, we count in order to occupy striated space. Thus we structure the city before living in it. *Taking the distinction to the level of thought and knowledge*, an example might be the medical thinking of a previous decade in which certain divisions that seemed exclusive and fixed are now blurred – living versus non-living – where do you put prions, parasite versus inclusion – where should we put the viruses that have incorporated themselves into human DNA through the eons of human evolution?

Deleuze and Guattari explain that nomadic science, the science of smooth space, often contributes to major science, renewing it. Even so, minor science would be insipid without the rigour of major or State science. The striation of smooth space is a complex issue. It cannot be done very well: try striating infinity, or the slightest angle of declination. This

means that striation is done by verticals and tangents: these cannot gain control of a very small angle. Nor can lamination, the process used in striation, control smooth space at a macroscopic level. At the other pole, it escapes them by the spiral or vortex, in other words, a figure in which all the points of space are simultaneously occupied according to the laws of frequency or of accumulation, distribution; these laws are distinct from the so-called laminar distribution corresponding to the striation of parallels.¹ Using a mathematical model, they tell us that the striation of smooth space EBM, which I depict as an aspect of State science, tries to striate the smooth space of medical practice, and I argue that this can be done only incompletely.

...is an operation that undoubtedly consists in subjugating, overcoding, metricising smooth space, in neutralising it, but also in giving it a milieu of propagation, extension, refraction, renewal, and impulse without which it would perhaps die of its own accord:..."²

1.2 State science and nomadic science

Deleuze and Guattari explain that, from the point of view of the State apparatus, the war machine appears in negative form: “stupidity, deformity, madness, illegitimacy, usurpation, sin.” The war machine betrays everything. Deleuze and Guattari go on to explain the *difficulty in conceiving of the war machine*. It is everywhere exteriority – the unfamiliar and wild or unstructured – , whereas the State apparatus is everywhere interiority, what we are accustomed to, and from which we take our point of view. They depict the war machine in terms of the expression of feeling which then becomes affect. Projected with velocity, this affect of love or hate becomes exterior.

Deleuze and Guattari introduce epistemology here. There is, they tell us, a scientific dimension to the conflict between 1) the State/interiority and 2) the war machine/exteriority. Deleuze and Guattari³ distinguish a State science from nomadic science, or minor science, or at least a way of treating science. The former is the traditional science, hallowed by the State, but the latter is not supported by history, law, or royal authority. Because nomadic science does not develop from a recognized centre, Deleuze and Guattari refer to it as “eccentric science”, and set out four characteristics. It posits a fluid model rather than a solid/fluid model--“Flux is reality itself”.⁴ Secondly, the eccentric scientific model depicts becoming and heterogeneity, rather than fixed scientifically investigable types with their “homogeneity” within categories for the purpose of grouping and generalizing. This contrasts with the stability and constancy in the State science model. Thirdly, rather than occupying a rectangular, striated space, the eccentric science involves a vortical (like a vortex) movement in open space. There are flows in smooth space. This contrasts with State science in striated space, which is set out in matrix form before use. Fourthly, the eccentric science is occupied with problems produced by affect – the restless desire to be able to do certain things. Working towards their solutions is the task of the war machine. The pathway is punctuated by accidents, movements, change, and is typified by events, rather than essences. The nomad signifier is essentially disruptive, and is like a tent – temporary, shifting, adjusting to local conditions, but providing a kind of shelter within

¹ Deleuze and Guattari 1987, p. 489.

² Deleuze and Guattari 1987, p. 486.

³ 1987, pp. 361 ff.

⁴ Deleuze and Guattari 1987, p. 361.

which state-like processes can go on. By contrast, the State science is immersed in rationality – like a house or castle or farm with fences.

The war machine is projected into an abstract knowledge which is developing away from the centre of the State science, and which is formalised differently from the State science. (For example, this eccentric science relates differently to technology.) The State science has a complex relationship with the nomad or minor science.⁵ The State science partly excludes and belittles the minor science, (describing it as a “prescientific, parascientific or subscientific agency”⁶) but otherwise dominates it, siphoning off some of its results and its thinkers. These latter are then in a state of imbalance between being 1) energised by the war machine and 2) saturated with rationality. The minor science pressurises the State science, which sometimes yields, to a degree, incorporating some of the viewpoint of the minor science, structuring this new material in its own fashion. Symmetrically, the minor science detaches aspects of the State science. The upshot of these gains and losses is that the border is always changing, as is the uneasy relationship between EBM, academic medicine, dissenters from the dominant paradigm, and real practice.

One of the discordant differences between State science and minor science lies in the division of labour, which is largely determined by the pattern of scientific activity. State science and minor science divide their labour differently. For example, there are differences in the type and level of skill, and in the numbers of workers, and their geographic distribution. This is one of the reasons why State science resists minor science. Any gain in ground made by minor science involves a change in the distribution of labour. This can have profound economic and social implications, and is likely to be resisted with all the might of capitalism. An example would be the promotion of meditation as a substitute for tranquillizers.

State science has been developed around gravity, seriousness and rectitude. This is related to the arborescent form of knowledge and the structuring logos of rectitude. This vertical force has led the way to the concepts of “parallel” and “horizontal”. These are derived from the vertical force of gravity.

Homogeneous space is in no way a smooth space; on the contrary, it is the form of striated space. The space of pillars. It is striated by the fall of bodies, the verticals of gravity, the distribution of matter into parallel layers, the lamellar and laminar movement of flows.⁷

Over the centuries scientists and mathematicians have developed a striated space, bringing in Euclidian geometry. They have identified the straight line as the shortest path between

⁵ Nomadic science is science which cannot firmly plant its roots in any particular well structured scientific discourse because the ontology or metaphysics of those discourses do not adequately capture the things, explanations and phenomena that one needs to be able to understand. Nomadic science therefore takes resources where it can and uses them in ways that the contributing disciplines would find undisciplined because it asks poorly formed questions that do not properly respect the current contours of debate. For instance, when one asks how the legislative context and the political emancipation of women affects the biology of the HIV virus this sounds like an illegitimate question. Or if one asks how the MAO levels available in the amygdala of the right temporal lobe are influenced by a history of colonization, that sounds equally flaky and disruptive or destructive in terms of orderly, striated science (“Personal Communication”, Gillett, 2010).

⁶ Deleuze and Guattari 1987, p. 367.

⁷ Deleuze and Guattari 1987, p. 370.

two points, and the “multiplicities termed metric or arborescent”.⁸ By now we have a space which is homogeneous, and visual. Of great importance is the universal attraction between two bodies. With these principles, any part of the world can be a striated space, the striation not being tied to any one part of the earth. Whenever a new field of science arises, royal science tries to mould the new science into this homogeneous structure. Deleuze and Guattari state that chemistry moved forward once the concept of weight had been elaborated.⁹

Nomadic science is not like this. While it does not refute gravity and its associated phenomena, it is not dependent on them, and cannot be reduced to them. It lodges in a supplement or excess, over and above gravity and is correlates. A fundamental departure was the slightest excess of angle, the slightest deviation from the straight line. Take, for example, a body which falls along a curved path. *This freedom allows nomadic science to reach into unstructured areas.* By now we have the space of the smallest deviation, and this is smooth space.

*...therefore it has no homogeneity, except between infinite proximate points, and the linking of proximities is effected independently of any determined path. It is a space of contact, of small tactile or manual actions of contact, rather than a visual space like Euclid's striated space.*¹⁰

Smooth space is heterogeneous and occupied by different multiplicities. These are acentred and rhizomatic. Deleuze and Guattari apply the words *rapidity* and *celerity*¹¹ to movement which deviates even minimally. As pointed earlier, this movement is vortical (as in a vortex or spiral) and actually draws smooth space. “All the points of space are simultaneously occupied according to the laws of frequency or of accumulation, distribution; these laws are distinct from the so-called laminar distribution corresponding to the striation of parallels”.¹² EBM, so structured, cannot reach into all of smooth space, and so cannot relate adequately to the partly disorganized world of human health, with its polyglot forces. In fact, the qualitative opposition gravity-celerity, slow-rapid, heavy-light is coextensive with science but does not constitute a quantitative part of it. Rather it provides a space for distinguishing between striated space and smooth space, and it regulates their interaction, including the domination of one by the other.

Royal science is characterised by reproduction, while nomad science allows thought to get away from the traditional base, such as *the subject*, or *humanity*, and to wander freely, to create new areas.¹³ In royal science, then, there is enough lattice-work to provide for constant relations between variables and continuity between competing representations. Deduction and induction are possible. For reproduction to occur, a fixed point of reference is available from which to view the process. These are not the processes of itinerant or

⁸ Deleuze and Guattari 1987, p. 370.

⁹ 1987, p. 370.

¹⁰ The use of a straight line to limn a curve is well characterized mathematically by means of tangents, as Aristotle notes, but the use of a curve to map another curve is not well established and so with smooth or nomadic science there may not be striated or well organized relationships of mapping between the discourse and its structures of meaning and the phenomenon of interest.

¹¹ Swiftness.

¹² Deleuze and Guattari 1987, p. 489.

¹³ Colebrook 2002, p. xxvii.

nomadic science, which moves in smooth space, in search of singularities of matter or material, rather than form. The meaning of the world changes. This is because the deterritorialization creates the territory. Instead of calculating constants which bind variables, nomad science tracks the variations of the variables, as in language.

The State science is always trying to striate the smooth space. A multiplicity in smooth space is at risk of having a grid of parallel vectors superimposed. Then it can be visualised from a vantage point. By contrast, nomadic science would have followed the multiplicity "in an 'exploration by legwork'".¹⁴ The nomad science tries to retain or regain its smooth space, where it can follow the singularities in vortical flows. State science is often interacting in complex ways with the leaders of nomadic science, sometimes conferring a minor position in its system upon one of them.

State science, including experimental science, have considerable conceptual equipment and metric power, but ambulant sciences are not able to evolve autonomy. Always in problematic mode, they draw, and link up, smooth space. They follow the flow of matter, and so stay with reality. However, the modus operandi of State science is to extract operations from intuition, setting up categorised structures. Some resources are devoted to safety, as in the building of a bridge from diagrams. By contrast, nomadic science's problem-solving modus operandi often takes it into uncharted territory as it moves from singularity to singularity. With regard to the inattention to safety as nomadic science proceeds, it is likely to have to sort out the consequences in real life. Deleuze and Guattari¹⁵ explain that nomadic science works, often intuitively, among problems, but often needs the resources of State science to structure and solve these.

Underlying these considerations is the layer of reality called "thought". Bear in mind that Deleuze and Guattari consider thought to be an active ingredient of life. (So it would be more accurate to place thought "within these considerations".) These authors depict a circular relationship between the State and thought. All thought conforms to a model of thought produced by the State. But surely we have a way of thinking about the State? But we are told how to do that. So which comes first?¹⁶ They proceed to describe two heads of thought. "There is an imperium of true thinking....constituting the efficacy of a foundation (mythos); a republic of free spirits proceeding by pact or contract...(logos)".¹⁷ For example, an organism has a lawlike operation that can be studied within its own boundaries as a homeostatic system. (This is related to the episteme of ideal rationality which neglects the relationship between power and knowledge.)

Deleuze and Guattari go on to explain the benefits of this symbiosis. From the State, thought gains gravity. Actually, its heaviness takes thought out of the daily arena, to some extent. Then it goes unchallenged, and with it the benefits to the State. Perhaps it goes unnoticed that the State-form has a consensus. How, without thought, could we fabricate a notion of a State possessed of "de jure universality".¹⁸ So the State alone divides subjects into "rebel" and "supportive". Taking advantage of the status of reason, the State characterises itself as

¹⁴ Deleuze and Guattari 1987, p. 373.

¹⁵ 1987, p. 374.

¹⁶ Deleuze and Guattari 1987, p. 374.

¹⁷ Deleuze and Guattari 1987, p. 375.

¹⁸ p. 375.

“the rational and reasonable organization of the community”.¹⁹ Drawing on the power of the State, reason is fleshed out as the State. “It was all over the moment the State-form inspired an image of thought. With full reciprocity”.²⁰

Deleuze and Guattari²¹ amalgamate exterior thought and the war machine, in their model. Describing noology as the study of thought images, they explain that “outside thought can disturb the results of this endeavour. They explain that relating these nomadic, scattered thoughts to forces, is not straightforward. For example, Nietzsche's aphorisms, as distinct from maxims, await being operationalized by forces (people). They are calculatedly disruptive and challenging.

You shall be such for me that your eye is always seeking an enemy—your enemy. And with some of you there is hate at first sight.

*You shall seek your enemy, you shall wage your war—and for your own thoughts!*²²

Certain forces (people) will convert these thoughts into a war machine. Thus Deleuze and Guattari introduce a diachronic dimension to the amalgamation of nomadic thought into a war machine. Occupying smooth space, these outside thoughts do not function in a method, as in striated space. The arrow (thought) does not move from point to point. It is taken up at any point to be sent to any other point. The points are determined by the change in direction of the thought, or the creation of one thought from another, not vice versa. The thoughts are primary, the points secondary. This resembles the movement of nomads.

States must gain control of smooth space, if possible. For example, they set up systems to control the movement of ships on the sea, especially the Suez canal, because that is a vital junction that controls movement among major domains of opportunity and they police the airways. During the cold war, it was unacceptable for a Russian fighter plane to fly through the air above the USA. As part of this process of extending its communication channels safely through smooth space, the State acts against nomadic movements. This is all part of their aim to control all flows, everywhere. Those movements which are allowed are assessed on several parameters, such as proximity to striated space, speed and direction. These are relativized to the striated space. Here Deleuze and Guattari write of deterritorialization of the earth: when States acquire control over smooth space, they pay little attention to the details of the subordinated nomads, who may themselves be attuned to the reality of the smooth space. An example would be the use of intravenous Vitamin C in the critical zone of the Intensive Care Unit (ICU).²³

In section one I have given a post-structuralist account of smooth space/striated space and of nomadic science/State science. I have taken the view that EBM is an aspect of State science which provides no account of nomadic science or smooth space. As far as possible these should be supplanted. I place the doctor and patient with her problems in this smooth space, starting this chapter. I now proceed to the medical gaze/EBM gaze which I depict as striated and striating.

¹⁹ p. 375.

²⁰ An example of this reciprocity would be between funding and the biomedical model such that more wild and singular explorations are marginalised.

²¹ 1987, pp. 376-7.

²² Nietzsche 2005, p 41.

²³ Gillett 2011, p. 8.

2. The medical gaze

2.1 The configuration of disease: The space of pathology

Once pathological anatomy had attained high status in the nineteenth century, the space of configuration of disease became superimposed on the body (where it remains). The medical gaze superimposes pathology on anatomy: for instance, a histopathologist looks down a microscope and “recognises” a tubercle, a lesion pathognomonic for tuberculosis. With her training in pathology, she extrapolates from the tubercle under the lens to the disease configuration called “tuberculosis”. Foucault says of the sovereign moment of diagnosis,

*The “glance” has simply to exercise its right of origin over truth.
But how did this supposedly natural, immemorial right come about? How was this locus, in which disease indicated its presence, able to determine in so sovereign a way the figure that groups its elements together?*²⁴

The space of the configuration of disease has several principles. The knowledge is historical. This means that over, say, two days, a range of symptoms and signs manifests itself to the clinical gaze. Secondly, the *cause* is in the same space as *effect* but Foucault depicts this space without a temporal dimension so that time does not figure in this model. In this model of the configuration of the disease, “There is only one plane and one moment”.²⁵ (Bear in mind that “disease” is an abstraction, like a map. “Disease” is a conceptual system, a reification of a dynamic process which may or may not share some core features, across individuals--one that we happen to be good at picking up.) A third principle is: “It is a space in which analogies define essences”.²⁶ This means that the differences between two diseases, such as pneumonia and influenza, is established by analogy through the extent to which their surface pictures resemble each other (both exhibit fever and cough, but sputum or the presence of basal crepitations²⁷ characterise only pneumonia). Lastly, Foucault explains how patient and doctor are interlopers in the disease process or space. Each specific patient distorts the ideal picture of the disease because the patient both reveals and conceals the disease, and the doctor is in a strange situation using her knowledge of disease as a guide, in that she never experiences the disease in ideal form. The doctor chases the disease through her patient who distorts the ideal form. In order to know the truth of the pathological fact the doctor must abstract the patient.²⁸ What is more, as soon as the doctor begins treatment, she further distorts the disease, if the treatment is effective.

If Foucault is correct, then it is very difficult to practise “patient-centered care” (PCC), which has been defined as “quality healthcare achieved through a partnership between informed and respected patients and their families, and a co-ordinated healthcare team”.²⁹ The practice of PCC is difficult because of the nature and complexity of the diagnostic process. Using her knowledge of pathology as a map or guide, the doctor goes on a hunt for one or another disease or map defined in relation to others by comparison and contrast. But, as

²⁴ 1994, p. 4.

²⁵ 1994, p. 6.

²⁶ 1994, p. 6.

²⁷ These are fine crackles heard, often at the lowest part of a lung.

²⁸ Foucault 1994, p. 8.

²⁹ In a 2004 study of patient-centred care, the American National Health Council defined PCC (alfutures.com).

explained in the previous paragraph, the patient a) obscures and b) distorts the ideal picture the doctor is trying to bring into bold relief, although the patient also, perhaps reluctantly, reveals the disease. Using shingles (Herpes Zoster) as an example, the patient may obscure the disease by presenting with pain in the renal area. Many doctors make the wrong diagnosis before the characteristic rash arrives on about the fourth day. With regard to the distortion each patient makes, a doctor may be accustomed to seeing shingles in elderly patients. But if the patient with a painful rash is ten 10 years old, the diagnosis is difficult. (Of course, if the correct diagnosis is made, then the patient has revealed the disease.) Continuing with my assertion that the diagnostic process makes it hard to practise patient-centered care, Foucault explains that the doctor is constantly seeking lacunae. She thinks in the space between true and false (for example, hyperventilation due to anxiety *or* metabolic acidosis), and in the space between viral and bacterial, and in the space between benign and malignant, and in other spaces. This difficult thinking, which surely distracts from thinking about the patient only or the patient at the centre of the process, can be pictured in a space between obscurity and clarity of the disease. In this space is the interaction between the body and the disease. It does not fit the ideal forms captured in the canonical texts and treated with canonical methods. Thus I have postulated a tension between the primary space of pathology and the secondary space of the individual person, as set out by Foucault in *The Birth of the Clinic*.

2.2 The medical gaze in more detail

2.2.1 History

Canguilhem³⁰ and Foucault extensively develop the space of perception. The term used here is “gaze”. The gaze is the perception of the doctor, perceiving the patient, and is scopic or visual. This is because, since the end of the eighteenth century, the post-mortem examination--which is visual--has fundamentally determined how doctors view the diseased patient. Doctors look back from death, in which medical truth is revealed, to life. Secondly, Foucault allows both auditory and tactile modes of perception to intertwine with vision in the gaze so that a doctor examining a patient's chest might look at the breathing rate, touch the pulsation of the lowermost, leftmost point of distinct cardiac pulsation, and listen to the breath sounds, the three forms of perception functioning together. However, the sight--hearing--touch perception system is subject to the absolute gaze of knowledge. This latter is dominated by death, in that, as previously explained, the post-mortem examination is the foundation stone of medical epistemology.

2.2.2 Pathology dominates the gaze. A new role for death. Medical epistemology modernised

Foucault makes three very interesting points about this imperious, death-infiltrated, gaze. The first is that “The 'glance' has become a complex organization with a view to a spatial assignation of the invisible”.³¹ “The structure, at once perceptual and epistemological, that commands clinical anatomy, and all medicine that derives from it, is that of *invisible visibility*”.³² A doctor (and this is the second point) is drawing a 3D picture, not learning,

³⁰ 1978.

³¹ Foucault 1994, p. 164.

³² Foucault 1994, p. 165.

when she steadies her gaze on the patient. Obviously, the doctor detects from the 2D surface (usually: sometimes the doctor conducts an internal examination, for example of the rectum, after which she is no longer limited to a 2D assessment) of the body a few clues, through sight, hearing and touch. (When a doctor hears a certain type of murmur between the first and second heart sounds, she may visualise a narrowed space between the cusps of the mitral valve. When she palpates the lowermost, leftmost point of distinct cardiac pulsation and finds it is further to the left than normal, she visualises an enlarged heart.) The gaze uses knowledge of human life, derived from post-mortem examination, to build a 3D (functional) model of the body's disease. This aspect of the Foucauldian gaze is important with regard to EBM because its epistemology assumes that the 3D picture is objective. But it implicitly undermines EBM evidence in that EBM evidence provides *a* truth, rather than *the* truth. After all, each doctor might build a different 3D model. A third interesting point made by Foucault about the gaze is that it medicalises the human world. This means that people are now viewed in a dichotomy of diseased--healthy whereby "...one did not think first of the internal structure of *the organized being*, but of the *medical bipolarity of the normal and the pathological*".³³ EBM has inherited this powerful bias, this binary thinking, not that of life and health and normal living.

I have indicated that the post-mortem examination laid the foundation of the medical gaze which henceforth would establish disease as individual and require a nuanced use of the old language to express the newly perceived realities of pathological anatomy in combination with the age-old symptoms. However, Foucault explains two other developments arising from the use of the post-mortem examination. One is that death, as well as being individualised, was also concretised. It moved into the space previously occupied by the gods and immortality. There was a decrease in theory and systems that had befuddled earlier generations of doctors.

Early in the nineteenth century in France, the belief that disease had an essence which "was both nature and counter-nature",³⁴ was removed from the medical gaze. To constitute the new gaze then, the post-mortem examination had to form or inform the foundation of medical epistemology--

*In anatomical perception, death was the point of view from the height of which disease opened up onto truth; the life/disease/death trinity was articulated in a triangle whose summit culminated in death; perception could grasp life and disease in a single unity only insofar as it invested death in its own gaze.*³⁵

From early in the nineteenth century, death built into the gaze a better understanding of life and disease, using the anatomical--clinical model. Death also built into the gaze the dissolution of disease, and the limited nature of disease as that which enabled death, rather than death being the consequence of disease. Thus the medical gaze is henceforth structured to regard death as more fundamental than disease, which death elucidates (through post-mortem examination) and terminates (hence it is basilisk-like).

³³ Foucault 1994, p. 35.

³⁴ Foucault 1994, p. 155.

³⁵ Foucault 1994, p. 158.

The epistemological foundation stone for this view of disease is, by now, the post-mortem examination and from that origin the gaze proceeds to construct the individual. Previously, clinical medicine had dealt with cases. But the new gaze is to be different. The post-mortem examination provides information about the individual so disease is primarily the disease of an individual. It is no longer the case that each individual presents a variation on a general phenomenon. Thus the idea that the individual is an exemplar of a general phenomenon is now problematised.

2.2.3 The gaze is multifaceted

The gaze is “not content to observe what was self-evident”.³⁶

Foucault explains that the gaze involves possibilities and probabilities, risks--and experience. He reminds us that society confers authority on the doctor, so that the doctor from her gaze, announces the truth (The doctor says she has cancer: so she has cancer).

In the clinic, it was a question of a much more subtle and complex structure in which the integration of experience occurred in a gaze that was at the same time knowledge, a gaze that exists, that was master of its truth At this level there was no distinction to be made between theory and experience, method and results; one had to read the deep structures of visibility in which field and gaze are bound together by codes of knowledge;...the linguistic structure of the sign and the aleatory structure of the case.³⁷

2.2.4 Disease is now visible, but needs to be articulated

Here Foucault draws attention to the need for a language that relates the signs and symptoms of diseases to human understanding and communication. This matter belongs in linguistic and semiological spaces. Bear in mind that the gaze includes questioning the patient, in language. The patient answers verbally and non-verbally. Foucault explains that language needed to adapt to the new knowledge so that the disease of the individual could be seen. Doctors who conducted the post-mortem examinations needed to clothe the new knowledge in words that would convey it to absent clinicians:-

It is no longer a question of correlating a perceptual sector and a semantic element, but of bending language back entirely towards that region in which the perceived, in its singularity, runs the risk of eluding the form of the word and of becoming finally imperceptible because incapable of being said.³⁸

Foucault tells us how the language was adapted to express the new perceptions “to introduce language into that penumbra where the gaze is bereft of words”.³⁹ He mentions the use of colour, metaphor, empirical comparisons, the value of intersensorial qualities, and references to the normal and everyday. Many of these ways of making the perceived expressible were deployed by Laennec, whose early description of one cirrhotic liver, quoted by Foucault, exemplifies these linguistic developments.

³⁶ Foucault 1994, p. 89.

³⁷ pps. 81, 90.

³⁸ Foucault 1994, p. 169.

³⁹ 1994, p. 169.

The liver...when cut, it seemed to be made up entirely of a mass of small seeds, round or oval in shape, varying in size from a millet seed to a hemp seed. These seeds, which can be easily separated, left almost no gap between them in which one might be able to make out some remaining part of the real tissue of the liver; they were fawn or reddish-yellow in colour, verging in parts on the greenish; their fairly moist, opaque tissue was slack, rather than soft, to touch, and when one squeezed the grains between one's fingers only a small part was crushed, the rest feeling like a piece of soft leather.⁴⁰

I have alluded obscurely to an issue which needs clarifying. In Foucault, a distinction is made between a statement and the visible. I have explained that when the post-mortem examinations were first used to provide knowledge, it was necessary to develop a language--statements--to match the visible. Foucault provides an account of the difference in the nature of these two, the visible and the articulable. Read what Deleuze explains regarding Foucauldian theory:

...there is a difference in nature between the form of content and the form of expression, between the visible and the articulable (although they continually overlap and spill into one another in order to compose each stratum or form of knowledge). ...Between the two there is no isomorphism or conformity, in spite of a mutual presupposition and the primacy of the statement. ...there is neither causality from one to the other nor symbolization between the two, and that if the statement has an object, it is a discursive object which is unique to the statement and is not isomorphic with the visible object. Of course we dream of isomorphism,"⁴¹

I consider that all this eludes EBM. Does this matter? I argue that EBM rides rapidly over some deep and obscure issues yet urges us to change the way we treat sick people. EBM moves the articulable around from paper to paper and book to book to guidelines, but I suspect that these writers assume that the object of the statement is the visible object: I am sure that EBM protagonists assume that what we are saying matches what we are seeing. In simple terms, then, I am arguing that such complex, underlying issues make the strident assertions of EBM protagonists seem too strident.

2.2.5 Reconfiguration of the doctor, patient, consultation and epistemology

The other consequence of the new perceptual structure was that this visual system rested on an opaque base. This means that what lay beyond the base was not available for the constitution of knowledge. This is of enormous importance for EBM. Foucault postulates that a change in doctor/patient relationship has occurred over recent centuries in which the key element is epistemology. He uses the metaphor of a grid. By now doctor, patient and their interaction take place in this new grid. This is like children moving their game to a jungle gym. However, no analogy is complete, and, in fact, the children are newly configured (their bodies can go through different sequences), as well as playing by different rules which have resulted from a fundamentally different knowledge that the jungle gym prescribes. This is like a discipline that introduces a new habitas, like the posture associated with ballet.

Previously the doctor and patient were taken as given, not as problematic, although this is an exaggeration. Medical progress was considered to have occurred between the two

⁴⁰ Laennec, R. 'De l'auscultation mediate', vol. 1, p. 368.

⁴¹ Deleuze 2006, p. 61.

“givens”. For example, early in the twentieth century it became possible for a doctor to arrange for the patient's chest to be X-Rayed. But against this given-ness of the doctor and patient, both were constructions in flux. Late-twentieth-century patients began to manage their own asthma and diabetes, and the doctors also changed. Early in the twentieth century a chest physician had skills to map out the tuberculous cavities in the chest, with whispering pectoriloquy, percussion, and auscultation for bronchial breathing. The late-twentieth-century chest physician had lost some of these skills, but become expert in reading a chest X-Ray film. The chest physician had become subject--in turn--to the gaze. This applies with more force to the cardiologist and neurologist with electrocardiograms, electroencephalograms, ultrasound, magnetic resonance imaging and computerised axial tomography.

The space between doctor and patient changed to further complexify the shifting relationships. The physician moved closer to the patient, beginning to examine the rectum and vagina, and to pass a sigmoidoscope into the colon. These procedures brought the interior more directly under the scopic gaze.⁴² But further even again to these profound changes from a more subtle and profound level, Foucault challenges this “given”, unproblematic nature of the doctor, patient, and consultation space. In the last two decades, EBM has further reconstructed the patient, doctor and intervening space reconstructing the smooth and striated yet again:--⁴³

A more precise historical analysis reveals a quite different principle of adjustment beyond these adjustments: it bears jointly on the type of objects to be known, on the grid that makes it appear, isolates it, and carves up the elements relevant to a possible epistemic knowledge (savoir), on the position that the subject must occupy in order to map them, on the instrumental mediations that enables it to grasp them, on the modalities of registration and memory that it must put into operation, and on the forms of conceptualization that it must practice and that qualify it as a subject of legitimate knowledge. What is modified in giving place to anatomo-clinical medicine is not, therefore, the mere surface contact between the knowing subject and the known object; it is the more general arrangement of knowledge that determines the reciprocal positions and connexion between the one who must know and that which is to be known. The access of the medical gaze into the sick body was not... it was the result of a recasting at the level of epistemic knowledge (savoir) itself, and not at the level of accumulated, refined, deepened, adjusted knowledge (connaissances).⁴⁴

The EBM clinician makes little use of herself as a person.⁴⁵ Although her reality is with her patient, she quickly sets out on a conceptual trajectory which distances her from her patient. She first asks what group of Patients or experimental subjects her patient can be placed in. Then her mind continues to function at a distance from her patient by asking what Intervention she should consider. Third, her mind continues at a distance by asking what intervention is probably less suitable, for Comparison. Lastly, she projects herself out of the here and now by asking what Outcome, in the future, she is planning. This is the scheme for the PICO question, the start of the EBM process.

The modern (EBM) patient is biomedical, hopefully has one acute disease, depictable though the science of pathology, and is viewed against a background of one or more groups of similar patients whose disease has been investigated through one or more RCTs and/or

⁴² The physician moved to the other side.

⁴³ Of course, Foucault is writing of the early nineteenth century in France.

⁴⁴ Foucault 1994, p. 137.

⁴⁵ I draw on Wifstad 2008 for this line of thinking.

observational studies. Suitable treatment is available, and affordable. The modern (EBM) doctor is steeped in the studies and/or their downstream proliferations. She sees her patient against a background of groups of experimental subjects whose similarity to her patient she is assessing. Where possible, she is applying clinical guidelines. The space between doctor and patient is infiltrated with research/statistics, and the computer/internet. This is how the grid is constructed. Doctor and patient have moved towards the model of experimenter and experimental subject.

All parties work in a grid of knowledge that has been, or should have been, reconceived, not just increased. The legitimated knowledge is computerised biomedicine, connecting a biomedical patient with a guidelineed doctor. This legitimated knowledge has been produced by biomedicine's emblematic group, the protagonists of EBM—a group that has determined what counts as knowledge, who speaks authoritatively, and in particular, what counts as evidence, and what does not. Critically important are the reliability of evidence, the strength of the recommendations flowing from the evidence, and the power/knowledge supporting these.

Foucault makes the point that the sciences of Man and the notion of the uniqueness of Man and his individual qualities, separating him from nature and so on, were not so-called groundbreaking “discoveries”. The “Enlightenment” did not “roll back the frontiers of ignorance” and provide a means of knowing the “truth”. The “truth” was the product of discourse. Discourses may be understood as bodies of knowledge or disciplines, in themselves the form of disciplinary practices.⁴⁶ A discourse enables and limits what can be thought, said and written during a period of time. Discourses produce knowledges and knowledge is made known historically. The historical constitution of knowledge undermines any claim that knowledge is impartial or better than previous knowledge. Foucault does not see an extra-discourse point from which we can assess the correctness of any discourse. Thus the truth about “Man” is not a pale reflection of a real, natural man, idealised in form and content but the actual, engaged, situated human beings described in social sciences and works of art.

It is my contention that EBM does not acknowledge the Foucauldian insight that EBM does not investigate and treat an objective patient, through an objective doctor. Foucault would argue that EBM has constructed the patient, the doctor, and the consultation space. As stated above, EBM has not just added to our knowledge, EBM has set up a new knowledge. And not only that. EBM has established itself as the creator of knowledge, has decided how knowledge is legitimated (through RCTs and observational studies leading on to an hierarchy of evidence and the strength of recommendations flowing from the evidence). It is my contention that all this floats free of evidence, and that the medical profession has not debated it to an agreed conclusion.⁴⁷ You could say that EBM has not just altered the goalposts. It has moved us to a new football field and reconfigured the teams and the rules. And yet in some ways EBM plays as if we were on the old field (realistically or mind-independently construed). It's proponents do not acknowledge the constructed status of the patient, the doctor and the consultation space. They do not acknowledge that the patient is set up in terms of variables and mechanisms which EBM can investigate and treat. The investigating gaze of the EBM doctor takes itself to be dividing even to the joints and marrow of nature itself (“cutting nature at the joints”), armed with the spirit of truth.

⁴⁶ Coveney 2006, p. 4.

⁴⁷ Miles et al. 2008, p. 621.

With regard to health care research, the topics selected for investigation will need to fall within the area of intersection of the gaze and health care. The EBM doctor will look for problems suitable for investigation (which assumes funding) through RCT or observational study. Typically this will involve holding one or more variables constant while altering one or more other variables. Obviously, this assumes that such variables can be isolated and dealt with. But there are many aspects of health care which would struggle to fit into this model. For example, palliative care has developed a discourse of dying. There is now a right way to die: quietly. Patients should realise that there comes a stage when definitive treatment should yield to symptomatic treatment. Patients should be actively involved in decisions. But some patients reject this modern discourse on dying. I am not sure that EBM investigates ways a team steeped in the palliative care discourse can work together to support this recalcitrant patient. An issue here for EBM is that the team may be divided as to how to proceed.

Gillett⁴⁸ gives an account of HIV/AIDS as a postmodern illness which reveals the limitations of biomedicine, and therefore EBM. In the West, at any rate, the illness follows a period in which traditional values were challenged. This means that some men formed sexual relationships with other men. Other people injected drugs intravenously. These choices confronted the power of biology, in that some people developed HIV/AIDS. Despite extensive research, the (biomedical) treatment for this condition is only partly effective. Sufferers were forced together to try to deal with prevention and education and to support each other in grief. This group of people, accustomed to challenging the social hierarchy, developed partnerships with their health providers, negotiating treatment. Doctors and sufferers had to face the question of whether to tell the partner that the patient had tested positive. Ethical questions arose over testing people for the virus. Although I have referred to the West, the condition spread extensively in the third world. In Africa, Gillett⁴⁹ tells us, some men enjoyed their sex with or without the preparedness of the woman. Women often have little education, political power, or rights within the marriage. This all facilitated the spread of infection among women, and therefore among men and children. An ethical issue arose over research into this condition. Largely led by Western organisations, any such research in third world countries was bedevilled by the fact that those who took part in the research were unlikely to be able to afford its benefits. In one study, some desperate research subjects managed to decipher the code in the RCT and break protocol by handing around the active moiety. The point I am making is that there is a (disease) space in which culture and biomedicine meet. With Gillett,⁵⁰ I submit that much of what I have described is poorly handled by EBM, whose gaze is restricted—EBM is blind to certain aspects of the problem that is human disease and therefore it may be blind to critical determinants that will make a real difference to the suffering caused. Then with Foucault, I draw attention to the dominance of the narrow EBM discourse and to the association of knowledge and power. The western biomedical gaze constructed our solutions in terms of pharmaceutical remedies rather than in terms of socio-political change, revealing the hegemony of the biomedical, pathological anatomy gaze.

⁴⁸ 2004, Chapter 8.

⁴⁹ 2004.

⁵⁰ 2004.

The medical gaze has been said to discriminate against some patients. Such issues as social class, gender, race and whether the patient is paying, have received comment. The medical gaze struggles with comorbidity, and with poorly defined problems and language problems. The medical gaze also struggles with the fact that the modern equivalent of the Hippocratic airs and spaces is to widen our gaze to the socio-culturo-politico-historical contexts of disease. As stated above, this last struggle has implications for patients with AIDS, for example.

The gaze surely includes the higher valuation which doctors place on signs as distinct from symptoms. This is described by Foucault,⁵¹ who explains how numerous chest diseases can be heralded by such symptoms as cough and shortness of breath. However, early in the nineteenth century, Laennec focused on examination of the chest. He found that, in a few patients, the voice was transmitted surprisingly well to a small area of the chest wall. He called this clinical sign "pectoriloquy", and made the (epistemological) decision that this, rather than the symptoms, would establish the diagnosis (of Pulmonary Tuberculosis). To this day doctors prioritise signs (and particularly images and the results of laboratory investigations with their attached figures) over symptoms if they point to different diagnoses. In passing I note the very interesting point that Laennec made an epistemological leap. However, the point of this paragraph is simply to flesh in Foucault's medical gaze with more detail.

2.2.6 EBM rhetoric

EBM exaggerates the importance of its "gold standard" evidence in the EBM gaze. During the (PICO) conceptual excursion, the doctor needs look back at her patient and assess the patient's suitability for this research-based intervention. EBM leaders have, in 2008, provided detailed guidance on this. There is a complex issue regarding the judgment as to whether the patient is suitable for the intervention, the alternative, and even the outcome proposed. The doctor must know something of the patient, her attitudes, values, preferences, and perhaps even her social situation. With increasing emphasis on the business aspect of medicine and also the scientific aspect and the computer, this detailed understanding of the patient is declining in comparison to what it was in the time when most people lived in a country district and saw one doctor over many years. The knowledge of the patient, who is reified, is incomplete and inaccurate. Whatever assessment the doctor makes, the knowledge of the patient is fallible and not based on an RCT. *The knowledge of the patient is different in kind from the RCT knowledge.* This surely limits the entire EBM discursive practice which projects the image that it is based on the results of clinical studies. Even so, as stated by numerous authors, the gap between the group data and the individual's suitability cannot be reduced beyond a certain, unknown, distance. *The actual susceptibility of the patient for the researched intervention cannot be precisely known.* If the clinical doctor follows the study results and invokes the intervention for her patient, we can, at best, hope and believe that that the intervention will be helpful. Regrettably, if the patient improves, we still do not *actually know* whether the intervention caused the improvement, or was coincidental.

⁵¹ 1994, pp. 159-161.

2.2.7 The docile body

Foucault's *gaze* has been problematised. The trouble is that the patient does not look back! (This has been called “the docile body”, and does not square with phenomenology.) There is an air of dominance here. My comments on the sufferers from AIDS are a suitable antidote. I represent these patients as active in the medical relationship.

Bloor and McIntosh noted that the subjects of the surveying therapeutic gaze responded in various ways, including direct rejection and attack on the value and legitimacy of the health worker's⁵² attentions, non-cooperation, silence, escape, avoidance, and most-common of all, concealment.⁵³

In my work as a Police Medical Officer, I need permission to examine every patient in police custody. Sometimes this is not granted, even when the patient asked for a doctor, and I have travelled 22 kilometers during the night. In my third year I was challenged as to whether I was a Police Medical Officer (as I had stated) or “just a doctor off the street”. I always have a constable with me, so questions about the intake of drugs and alcohol, intended to help me assess the state of the brain, receive a variety of responses. Recently, in obtaining a history as to how the patient gained an incised wound in front of his patella tendon, I was given completely different accounts by the patient and constable. These police patients, then, sometimes show up one limitation of the medical gaze.

3. The medical /EBM gaze meets the smooth space of the doctor-patient consultation which includes the patient and her problems

I now bring the EBM gaze, which includes the results of epidemiological research, conducted on large groups of experimental subjects, into the smooth space of the patient. However, the reticulated knowledge of the EBM gaze is a poor fit for the smooth space of the patient. As the reticulated gaze arrives in smooth space, it leaves gaps between the laminae of the framework. Thus it fails to deal adequately with the smooth space of the patient. Consider the wild suffering and wellness that escapes medical surveillance because its flows of energy are not easily categorized into the diagnoses and tests that yield currency for EBM.

EBM has forced us to develop our understanding of the application of evidence derived from large groups of experimental subjects to the individual patient and so has addressed one of its most frequently cited problems. “The inferential leap necessary for treating an individual based on aggregate findings is mostly assumed away”.⁵⁴ But in an RCT, some patients are excluded, subjects actually take their medication, the treatment period is likely to be short and closely monitored in comparison with future widespread use of the treatment, and the control condition often uses placebo treatment, not a realistic option for the “nomadic” clinician.⁵⁵ The end points of the research may differ from the outcomes of interest to the doctor and/or patient, a problem not always captured in terms of internal versus external validity.⁵⁶ The theory which the RCT provides evidence for is therefore *not*

⁵² Strictly speaking, this quote refers to British health visitors calling on mothers, not actually to doctors.

⁵³ Lupton 1997, p. 104.

⁵⁴ Tanenbaum 1999, p. 757.

⁵⁵ Worrall 2010.

⁵⁶ Bluhm 2010.

the theory that the trialled treatment will, overall, be beneficial for the next patient. Therefore the relationship between group research (in striated space) and clinical care (in smooth or nomadic space) is not self-evident despite voices to the contrary.⁵⁷

The vexed issue of how apply the findings from population research to the individual patient is partly clarified by attention to patient characteristics (including age, severity of disease, comorbidity, ethnicity, and compliance with treatment regimens), healthcare system characteristics (skills of treating doctors, treatment or test availability, monitoring) and outcome characteristics (do study outcomes matter to the present doctor/patient dyad, surrogate endpoints, such as bone density rather than fractures, and so on).⁵⁸ The clinical doctor treating the individual patient on the basis of population research needs to notice the number needed to treat figure “for a group of individuals resembling their patient”,⁵⁹ and to carefully look into relative risks and absolute risks as they exist for the unselected people who walk into the clinic rather than the select group in whom study effects are seen. What is more, even though subgroup analyses reflect “patient diversity in risk for disease, responsiveness to treatment, vulnerability to adverse effects, and utility for different outcomes”,⁶⁰ subgroups of one are not part of that kind of science even though they are the norm in the nomadic space of real world clinical medicine. When we add ethical considerations of patient choice and the acceptability of treatment to the mix⁶¹ it is no wonder that results produced in a striated world do not apply at the contested margins of striation where nomadic knowledge charts its paths through smooth spaces of unstructured and sometimes chaotic experience.⁶²

EBM does not tell us how to mix and match the five warrants that plausibly should attend clinical decision-making. (These are: the results of clinical research, pathophysiological reasoning, clinical experience, patient preferences and actions, and system factors {such as the availability of a test or treatment.}) Differences in ontology, methodology, epistemology and ethicality criss cross the field.⁶³ Firstly, there is an ontological difference between pathophysiology and system factors. For example, while pathophysiology may be anchored in the biology of antibacterials, system factors may be anchored in health economics such that a general practitioner is not allowed to prescribe certain drugs. The difference in these two warrants is ontological in that they belong to different orders of reality. Second, an epistemological difference exists between clinical experience and the results of an RCT - one depends on judgments of similarity and difference between particular instances of illness (the last spinal empyema and this one) and the other on the adequacy of inclusion and application criteria relating particular cases to a general category (this pneumonia as an

⁵⁷ Silva & Wyer 2009.

⁵⁸ Bassler, Busse, Karanicolas & Guyatt 2008.

⁵⁹ Bassler, Busse, Karanicolas & Guyatt 2008, p. 2.

⁶⁰ Bassler, Karanicolas, Busse & Guyatt 2008, p. 1.

⁶¹ Bassler, Karanicolas, Busse & Guyatt 2008.

⁶² I must admit that the frequent emphasis in my work on the chaotic nature of clinical practice is perhaps excessive, and intended to contrast with EBM. I am aware that Descartes and many other great thinkers have been struck by orderliness in the universe, and its susceptibility to mathematical modeling. And there was some structure in the clinical consultation before EBM. For example, the results of pathophysiological experiments have guided doctors for a very long time.

⁶³ Kerridge 2010.

instance of bacterial infection). Thirdly, there is a difference between patient preferences and the clinical experience of the doctor as in the choice for abortion and the doctor's judgment that it will turn out badly for the woman concerned. There is a major ethical component in the way the decision is arrived at in that the patient chooses and the doctor can only advise on the basis of experience. Somehow these two warrants must be combined and how to do so is unclear.

We can draw two conclusions from this analysis of the difficulty in combining warrants for decision. One is that there is an epistemological crisis in medicine, since we now realise that we do not know how to amalgamate five streams of very different kinds of knowledge. The second is that we no longer know what (in real life) EBM is: 100 different doctors may combine the multiple warrants for decision in different ways and in this task of integrating the warrants, no schema has been agreed or even proposed.

I now direct more attention to the difficulty of combining the five warrants for decision. I actually simplify the problem by selecting just two of the five warrants. The problem then simplifies to: *how to combine the result of epidemiological research with clinical experience*. (I allow myself to wander a little between clinical experience and clinical intuition). Note that EBM uses the term "integrate" for the warrants for decision.

Deleuze and Guattari⁶⁴ provide an analysis of the impasse. (Note that there is a difference between clinical experience and clinical expertise.) Consider clinical research results and clinical expertise and recall the 2002⁶⁵ model of decision making whereby clinical expertise brokers the possibly conflicting claims of research evidence, patient preferences and actions, and clinical state and circumstances. The EBM desire to bring the results of clinical research into clinical decision making can be viewed as an attempt to striate smooth space—the epidemiological evidence is used to reticulate the smooth space of clinical experience/intuition and patient management.⁶⁶

Smooth space and striated space – nomad space and sedentary space – the space in which the war machine develops and the space instituted by the state apparatus—are not of the same nature. No sooner do we note a simple opposition between the two kinds of space than we must indicate a much more complex difference by virtue of the successive terms of the oppositions fail to coincide entirely. And no sooner have we done that than we must remind ourselves that the two spaces in fact exist only in mixture: smooth space is constantly being translated, traversed into a striated space; striated space is constantly being reversed, returned to a smooth space. In the first case, one organises even the desert; in the second, the desert gains and grows; and the two can happen simultaneously. But the de facto mixes do not preclude a de jure, or abstract, distinction between the two spaces. That there is such a distinction accounts for the fact that the two spaces do not communicate with each other in the same way: it is the de jure distinction that determines the forms assumed by a given de facto mix and the direction or meaning of the mix (is a smooth space captured, enveloped by a striated space or does a striated space dissolve into a smooth space, allow a smooth space to develop?). This raises a number of simultaneous questions: the simple oppositions between the two spaces; the complex differences; the de facto mixes, and the passages from one to another; the principles of the mixture, which are not at all symmetrical,

⁶⁴ 1987.

⁶⁵ Haynes, Devereux & Guyatt 2002.

⁶⁶ Braude 2009.

*sometimes causing a passage from smooth to striated, sometimes from striated to smooth, according to entirely different movements.*⁶⁷

If this is an accurate analysis, then it follows that rational integration eludes us with regard to the desire of EBM to resolve the conflict between the results of clinical research and clinical experiences/intuition.⁶⁸

There is another way of seeing why we cannot rationally reticulate smooth space and develop a method to overcome the difference because in the multiplicities we deal with in human life a kind of tacit knowledge, similar to clinical intuition/expertise, is indispensable.

*We have on numerous occasions encountered all kinds of differences between two types of multiplicities: metric and non-metric; extensive and qualitative; centred and acentred; arborescent and rhizomatic; numerical and flat; dimensional and directional; of masses and of packs; of magnitude and of distance; of breaks and of frequency; striated and smooth.*⁶⁹

While it is possible to create rules to deal with entities that are part of the same order, it is not rationally possible to reticulate or divide up a commodity which is heterogeneous and intensive. Take pain. Although doctors ask patients to rate pain on a scale of ten, we cannot move from there to arguing that if a treatment leads a patient to change the rating of the pain intensity from 10 to five, the pain (as an orderly variable) has been halved. There are many areas of medicine not amenable to rational metrication and biostatistics because they are intrinsically relational rather than objectively fixed.

In the last few paragraphs I argue that there is no rational way to merge the results of epidemiological research with clinical intuition. I heralded an epistemological crisis in medicine, though I am not the first to do this. So what are doctors doing? The method of mixing these disparate inputs lies not in any codified system. They are joined through implicit, not explicit, knowledge, as is learned by a house surgeon from her senior. The judgments involved are learned by the less experienced doctor. Thus the epistemological crisis moves into the field of tacit knowledge. A lengthy and detailed explanation, which draws on Wittgenstein and Kuhn, of the way in which all codifiable knowledge rests in a sea of implicit knowledge is developed by Tim Thornton⁷⁰ who argues that both scientific research results and clinical expertise rest, in fact, on tacit knowledge. Whatever codified knowledge is to be used, *judgement* is required as to which codified knowledge and whether and when to use it. For example, judgment is required in selecting a theory to apply to several diverse scientific problems. Thornton points out that the best and fullest accounts of EBM make this clear, but EBM does lend itself to distortion in which evidence-based medicine quickly slips into codified knowledge, paying little attention to the background use of judgement or implicit knowledge. The devil is in the detail as to the wise use of the term "based".

If Deleuze and Guattari⁷¹ are right, a method for reticulating decision-making warrants into evidential form is bound to fail⁷² in that new forms of evidence would suffer under the

⁶⁷ Deleuze and Guattari 1987, pp. 474-475.

⁶⁸ Braude 2009.

⁶⁹ Deleuze and Guattari 1987, pp. 483-484.

⁷⁰ 2006.

⁷¹ 1987.

tyranny of data,⁷³ and the whole approach of reticulating the warrants for decision into evidential form ignores the argument that the inputs cannot be construed as evidence. The attempt itself is a totalising tendency suited to a striated domain of action and not nomadic science and it marginalises the idiosyncratic aspects of patients, doctors, and their interaction so that “the movement challenges professionalism by disputing what and how physicians know, and especially by marginalising what one physician can know about one patient”.⁷⁴ This encounter-based knowledge is smooth or nomadic and does not have a settled scientific home.

The assertions of EBM, focused on the importance of clinical research, falter because medicine is at the intersection of several sciences and even of diverse scholarly disciplines each with its own mode of knowing. For example, the humanities, such as anthropology and history, emphasize qualitative evidence and argument. Ethics draws heavily on rational thought and the critical examination of claims to good practice. Therefore placing evidence from epidemiology and biostatistics in the dominant position for clinical understanding is hegemonic.⁷⁵ Post-structuralist writers interweave “evidence” with issues arising when one takes note of power and regimes of truth. Misak,⁷⁶ for instance, explains that narrative evidence can provide insight into what it is like to be sick, or to receive investigation and/or treatment that is likely to escape RCTs. She gives detailed comment on how we all assess what we are told and incorporate it into our stories and provides a framework for a still better assessment of the multiplicity and richness of clinical phenomena.

4. Reflections on science in medicine

EBM attempts to put medicine on a more scientific footing, using clinical epidemiology. As is well-known, the early protagonists were concerned about variation in medical practice, cost, and the clear possibility that even expert opinion may not square with the evidence derived from clinical research. One issue here is whether medicine can be classed as a science. The relationship between medicine and science is complex and much debated (Is medicine a science or an art? EBM protagonists have said that they will help provide the art of medicine with a scientific basis.). I take the view that medicine draws on a number of disciplines, including physiology, ethics, law, epidemiology and biostatistics, anthropology and so on. I have positioned my work to be alert to any tendency of epidemiology and biostatistics to dictate its rules of evidence to the whole of medicine. In this regard, I note that De Caro and Macarthur⁷⁷ introduce a volume which explains the difficulties scientific naturalism has in dealing with a number of issues which occur in medicine. For example, scientific naturalism, “where causes are thought of as mind-independent”⁷⁸ is under strain when it attempts to provide convincing accounts of intentional states, human freedom and personal identity, of patients, doctors and researchers. Scientific naturalism provides us with an account of objects placed in a world-as-studied-by-science. These objects can even

⁷² Tanenbaum 2006.

⁷³ Tonelli 2007, p. 505.

⁷⁴ Tanenbaum 1999, pp. 757-758.

⁷⁵ Holmes, Murray, Perron & Rail 2006.

⁷⁶ Misak 2010.

⁷⁷ 2004.

⁷⁸ De Caro and Macarthur 2004, pp. 10-13.

include meaning, motivation and values. However, De Caro and Macarthur⁷⁹ allude to a chapter by Huw Price, which draws attention to the "metaphysically substantial conceptions of reference and truth" supporting this object world. These authors note an asymmetry in this naturalism: it is heavy on the object but light on the subject. Explaining this, De Caro and Macarthur draw attention to the negligible attention paid to use of linguistic terms and expressions. This subject naturalism is strangely omitted. There is also their tendency to accept a fundamentally foundational and exclusively true and well-ordered scheme of knowledge with a unitary structure of justification and principles of validity and worth.

I consider that epidemiology and biostatistics exemplify scientific naturalism and cannot cope adequately with some aspects (such as intentional states, freedom, personal identity) of the lives of patients. From here it is a short step (via psycho-neuro-humero-immunology) to denying epidemiology and biostatistics supreme authority in medicine. This is an example of my application of philosophy to EBM. I hope this approach savours more of providing a viewpoint than the authority of philosophy. In any event, I am comforted by the last sentence in De Caro and Macarthur's "Introduction",⁸⁰ ending..." the distinction between science and philosophy is one that is constantly being negotiated."

In further consideration of what authority science has in medicine I now provide an answer to the question I asked two paragraphs back: *Is medicine a science or an art?* Montgomery, in her book, "How doctors think",⁸¹ tells us it is neither: it is a *practice*. By now I have argued that medicine is a practice which draws on science. If this is right we need be circumspect regarding any claim which science may make as to its authority, epistemically, in medicine. This matter has been dealt with extensively by many authors such as Miles, Loughlin and Polychronis. Rather than reiterate their viewpoints, I will limit myself to post-structuralist comment. According to Foucault, knowledge and power are inseparable. And from the point of view of Deleuze and Guattari, now that EBM has been so extensively problematised at the conceptual level by the above-mentioned authors, we are not in a position to anoint this approach to medicine as "the truth". In fact post-structuralist thinkers allow a range of pathways to knowledge, including the provision of knowledge by one doctor about one patient. Even patients can contribute knowledge. To what extent is the patient's pain reduced by the treatment? Heidegger, admittedly not a post-structuralist philosopher, tells us that *being* cannot be investigated as if it were an entity, using "positive" sciences like biology. Rather *being* has the structure of meaning, and is best investigated phenomenologically. It seems to me that pain is nearer to being than to an entity.

5. Conclusion

Much of what I have written has been written before. I believe that the cutting edge of my own contribution lies in the following points. The EBM process starts in smooth space, proceeds into codified knowledge, and returns to try to striate or organise smooth space. I have highlighted the rapid distancing from the patient involved in the PICO question and I look forward to providing an existential/phenomenological account of this in a later paper

⁷⁹ 2004, p. 10.

⁸⁰ 2004, p. 17.

⁸¹ Montgomery, K. *How doctors think. Clinical judgement and the practice of medicine*. Oxford: Oxford University Press, 2006.

on Heidegger. As the doctor assesses the suitability of the patient for the intervention she hopefully takes account of detailed advice provided by EBM leaders in 2008. Even so, I suggest that the more we focus on science, on business and on the computer, the more we move away from the relationship of yesteryear when a doctor, ideally, knew her patient. When all has been said and done, the *knowledge* which the doctor has of her patient's suitability for the intervention is of a different kind from the much-vaunted knowledge derived from clinical research. I take the view that this provides EBM with a scarcely-acknowledged soft underbelly.

I have drawn on the writings of Kerridge and Deleuze and Guattari to argue that the warrants for decision are heterogenous with regard to ontology, methodology, ethicality and epistemology and that they cannot be *integrated*, rationally. I have presented the process as warrants for decision being *mixed* through tacit knowledge, often learned from a senior doctor. I have presented clinical research as an example of striated space and clinical experience as an example of partly smooth space (intuition). Deleuze and Guattari explain that it is not possible to integrate smooth space and striated space. Not rationally. Thornton moves the issue into tacit knowledge.

I consider that EBM has scarcely noticed that it has partly constructed the (guided) doctor, the patient (consortium of variables) and the (research-infiltrated) consultation space. And it has scarcely noticed the meta-epistemological issue that it has set itself up to determine what constitutes medical knowledge and that it assumes the the visible and articulable are isomorphic. It has given no account of nomadic science and works with the belief that smooth space should be striated and that it can be striated. Never mind infinity, the smallest deviation and the space between the laminating parallel lines. EBM seems unaware that we know more than we can describe (this relates to the way in which tacit knowledge extends beyond the explicit knowledge in which EBM trades) and that whatever does not get into the medical/EBM/gaze is not a candidate for knowledge/research.

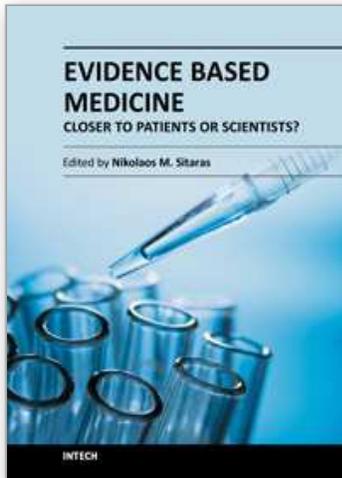
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Evidence-based medicine (EBM) was introduced to the best benefit of the patient. It has transformed the pathophysiological approach to the outcome approach of today's treatments. Disease-oriented to patient-oriented medicine. And, for some, daily medical practice from patient oriented to case oriented medicine. Evidence has changed the paternalistic way of medical practice. And gave room to patients, who show a tendency towards partnership. Although EBM has introduced a different way of thinking in the day to day medical practice, there is plenty of space for implementation and improvement. This book is meant to provoke the thinker towards the unlimited borders of caring for the patient.

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