Transdisciplinarity and the Vision of Stellenbosch University

Opening of the Workshop on Transdisciplinarity presented by the Sustainability Institute University of Stellenbosch

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In opening this Workshop I was asked to reflect on the vision of Stellenbosch University, and to relate that vision to transdisciplinarity. To begin with, therefore, let me tell you about us.

Our historical background should be considered by anybody trying to understand this University[1]. Stellenbosch is remarkable in many respects. It is, after Cape Town, the oldest European settlement in South Africa. It lies in an area of stunning natural beauty. The University goes back to the founding of a Theological Seminarium for the Dutch Reformed Church in 1859, and the *Stellenbossche Gymnasium*[2] of 1866 (renamed the Victoria College in 1887). It was formally founded in 1918 as an independent University, against all odds, to serve Afrikaners, at a time when British imperialism – political, cultural and linguistic – seemed to have triumphed in Southern Africa. The University became the nexus of turning Afrikaans from a local patois into a language of literature and science. Some of the great Afrikaner enterprises started in Stellenbosch[3]. For a time Stellenbosch was practically synonymous with rugby in South Africa. And then, of course, Stellenbosch was one of the main intellectual sources of apartheid[4].

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[1] I first delved into this matter in my address to the Convocation of November 2002, at a time when there was considerable fear and anger within our traditional support base about the future of Afrikaans as a language of Higher Education. There were striking parallels between the situation in Higher Education in 2002, eight years after the creation of a democratic South Africa, and the situation in 1918, eight years after the formation of the Union of South Africa, when the University was founded. See http://www.sun.ac.za/university/Management/Rector/convocation14nov.html .

[2] According to the minutes of the founding meeting in 1864, "Het doel van het Gymnasium is een grondig onderwijs in de vakken, welke tot een beschaafde opvoeding gerekend worden". ("The goal of the Gymnasium is a thorough instruction in those subjects considered to be part of a civilized education".) *Gedenkboek van het Victoria-Kollege*, De Nationale Pers, Kaapstad, 1918 (p. 39).

[3] It is no coincidence that the National Party, the insurance giant Sanlam ("Born out of the *volk* to serve the *volk*"), and the publishing empire now called Naspers (at first *De Nationale Pers*, with *De Burger* as its first publication) were founded in the same decade as the University of Stellenbosch – the latter actually also at Stellenbosch. Later examples of entrepreneurship broadly emanating from Stellenbosch include Stellenbosch Farmers' Winery (now Distell), the Rupert group and Rand Merchant Bank.

[4] See Hermann Giliomee's *The Afrikaners* (Tafelberg Publishers, Cape Town, 2003), Chapter 13: "The Making of a Radical Survival Plan". In Ida's Valley, one of the "Coloured" parts of town, Stellenbosch has been called "the maternity ward of apartheid".

The association of the University with the power structures of Afrikanerdom was, for a long time, a close one. DF Malan, the first apartheid Prime Minister, was a Stellenbosch man. Hendrik Verwoerd was a Professor of Sociology and Social Work here before turning to politics. John Vorster was a prominent student leader who later, as Prime Minister, became Chancellor of the University. The last apartheid President, PW Botha, likewise became Chancellor at the time of his political power (even though he had no previous connection with the University). Rectors of the University were typically prominent members of the Afrikaner Broederbond.

But Stellenbosch also produced a number of luminaries who found themselves outside the fold of a structured and inward-looking Afrikanerdom. One of them was General Jan Smuts (1870-1950), who as Prime Minister of South Africa also assumed the role of world statesman during the first half of the 20th century. Interestingly, Jan Smuts was also the originator of the philosophy of holism[5] -- a concept not far removed from the tenets of transdisciplinarity. On a local level, and despite the university's ties with the apartheid state, Stellenbosch produced a number of significant intellectuals who in varying degrees[6] questioned the apartheid dogma, such as Beyers Naude, Van Zyl Slabbert and Willie Esterhuyse.

The world of Afrikaner power and hegemony, and the centredness of Stellenbosch in such a world, came to an end on 27 April 1994. It is fair to say that for the remainder of the 1990s the University kept a low profile in national developments and debates. Once the old world had disappeared the idea of Stellenbosch as a *Volksuniversiteit* was clearly under threat, and the – quite natural – reaction of the University was to adopt a wait-and-see attitude. Thus the creative energy unleashed in the Higher Education sector post-1994 largely passed Stellenbosch by. There was, however, just sufficient critical mass of transformation-minded academics to press for, and come up with, a Strategic Planning Framework[7]. The laudable if somewhat broad sentiments in favour of transformation expressed in this document are still official University policy.

Given this background, what, then, is our vision for the University? It is, in short, *to transcend the past.* It is to to unleash the creative energy that flows from the juxtaposition of apparent opposites.

The key word is transcendence. Or rather, the key verb is *transcending*. To rise above. And we would like to rise above quite a few of the stereotypical apparent dichotomies confronting us.

I have referred to transcending the apparent dichotomy between a conservative past and a progressive future – between tradition, and vision. But there are many other such juxtapositions of apparent opposites. I would like to mention a few. Then I would like to make two comments about the way we deal with them. And then I

[5] See his book *Holism and Evolution*, Viking Press, NY, 1961.
[6] Examples are: Willie Esterhuyse's 1979 book *Afskeid van Apartheid* (published in 1981 as *Apartheid Must Die*); the 1986 publication *Die NG Kerk en Apartheid* (*The Dutch Reformed Church and Apartheid*) edited by Johann Kinghorn, and the conflict between the *Stellenbosch Gespreksgroep 85* ("Discussion Group 85") led by Sampie Terreblanche and Prime Minister PW Botha in 1987.
[7] See http://www.sun.ac.za/university/stratplan/statengels.doc .

would like to conclude by relating our vision for the University, and these methodological comments, to the topic of transdisciplinarity.

Any academic encounters, almost on a daily basis, a number of juxtapositions of apparent opposites.

- Pure / Applied
- "Blue-sky" / "Relevant"
- Knowing / Doing
- Disciplinary / Cross-disciplinary
- Science / Humanities
- Research / Teaching
- Quality / Efficiency
- Analysis / Synthesis
- Specialisation / Generalisation
- Private Benefit / Public Good
- Structures / Functions
- Subject / Object
- Qualitative / Quantitative

Typically we deal with these juxtapositions in terms of two Aristotelian precepts. One of these is already implicit in the term "dichotomy": it is the Aristotelian precept of the excluded middle – the "either/or" approach. That this approach is not always an effective one has by now been amply argued, in literature ranging from many-valued logics to management theory. The idea that we should replace "either/or", where and when appropriate, by "and/and", is no longer novel. That one should strive to translate the "and/and" approach into the outcome called "win/win" has become a management theory. From a professional point of view, incidentally, I am interested to read in Prof Nicolescu's *Manifesto of Transdisciplinarity*[8] that he refers to the "and/and" approach as the Principle of Included Middle. This is a rather nice name for what logicians have called three-valued logic, or paraconsistent logic – that is, logics that can accommodate contradictions.

But my concern and my contribution today is more with another Aristotelian precept. I refer, namely, to what Aristotle called "the principle of the mean", and which over time has become commonly known as the "Golden Mean". And my thesis is that the so-called Golden Mean, in many respects, is harmful.

Just to remind you what the principle of the mean says, I quote from Aristotle[9]:

> *Every knowledgeable person avoids excess and deficiency, but looks for the mean and chooses it. ... Virtue, then, is a mean condition... It is a mean between two kinds of vice, one of excess and the other of deficiency.*

[8] Basarab Nicolescu, *Manifesto of Transdisciplinarity* (translated from the French by Karen-Claire Voss), State University of New York Press, Albany, NY, 2002. ISBN 0-7914-5262-X.
[9] *Nicomachean Ethics*, Book Two, Section vi.

Thus courage is the virtue which lies between the two vices of rashness and cowardice, truthfulness lies between boasting and understatement, and so on. This principle of the mean is ingrained in our thinking and discourse at least as much as the principle of the excluded middle. I argue that we should question the applicability of the principle of the mean in the same spirit as we question the applicability of the pnnciple of the excluded middle. My reason for saying so can be summed up as follows: in like manner as the principle of excluded middle can lead us astray by dichotomising two topics of debate, the principle of the mean can lead us astray by *linearising* such topics.

Let met explain by referring to the list of apparent dichotomies above. Nobody will blink when I call the pairwise juxtaposition of those topics *apparent* opposites, because we have become quite aware of the harmful effects of appling the law of excluded middle too freely. Yet we have no compunction in applying the principle of the Golden Mean quite freely to such apparent opposites. It is very common to find in debates about these juxtapositions, that the point of dispute gets to be settled in the end by saying "we should find a balance". That is, we must find a balance between pure and applied research, between knowing and doing, between specialisation and generalisation, between Science and the Humanities – and so on. This conventional wisdom is premised on the belief that for any such juxtaposition there *is* a middle way. That there is a point in between, which offers a solution between two extremes. Moreover, it is premised on the belief, not only that such midpoint exists, but also that, to borrow Aristotle's terminology, the midpoint is *virtuous*.

The problem with this is that you can only balance two considerations if you put them on the same axis to begin with. In the same dimension. On one line. I contend that in many cases this is not a good idea. It is not a good idea because it starts out from an uncritical assumption: that the two considerations are comparable, by being two extremes of one dimension. My contention is that in many cases you will better understand the juxtaposition of these apparent opposites if you position them, not on the same axis, but *on orthogonal axes*.

To take an obvious example, certainly disciplinarity and cross-disciplinarity must be conceived of as orthogonal to each other, because cross-disciplinarity is nothing other than working orthogonally across the disciplinary silos. I contend that the same thought-experiment is useful also in considering, say, pure and applied work. There is in principle no balancing point between them, because they are not on the same axis. They are better considered as orthogonal to each other. Likewise for other apparent opposites such as analysis and synthesis, quality and efficiency, specialisation and generalisation, etc.

The point becomes clearer if we think, not in terms of scalars, but in terms of vectors. That is, consider each of the list of juxtapositions above to consist, not of two weights bearing down on either end of a rod balanced across a central support, but of two forces pulling in opposite directions. If, on this dynamic model, you still buy into the Aristotelian model of the mean, of searching for a balance, that compels you at the outset to position these two forces on the same axis, pulling in opposite directions. The problem with this approach is that two forces pulling in opposite directions are "balanced" only when they cancel each other out. Enormous amounts of energy may be expended, and yet very little movement may occur at the centre. The picture that

comes to mind is of two teams of burly men pulling in opposite directions from opposite ends of the same rope. Much groaning and sweating ensues, but there is very little actual movement.

Now carry out the following thought-experiment. Consider the two forces to be *orthogonal* to each other. Say one force is pulling in a horizontal axis towards the right, and the second force is pulling in vertical direction towards the top. Then they are still pulling away from each other. But now there is a *resultant vector*. The harder Force 1 pulls towards the right, and Force 2 towards the top, the more movement we get. The two forces are no longer cancelling each other out. Each is, in its own dimension, getting the movement it desires.

I contend that the Aristotelian principle of the mean is a principle at best applicable in a static situation, when two scalar entities may be weighed in a balance. I contend, moreover, that this principle is harmful when it is applied in a dynamic situation of different forces at work, because it constrains us, conceptually, to consider those forces as being on the same axis, hence cancelling each other out. And I contend that in many situations the dynamic analogy is more apt than the static one. If we talk, for example, of "striking a balance" between blue-sky research and relevant research, then the principle of the mean has led us astray. We should not strive to strike a balance between these two forces, because they are not on the same axis at all. "Blue-sky research" pulls you in one direction (towards the blue sky, evidently), but "relevant" research pulls you in another direction (towards Business and Industry across the street, for instance). And that is not a bad thing, because you might move both upwards and across at the same time, under the simultaneous influence of both forces.

I contend, therefore, that in many cases it is useful to consider apparent opposites to be positioned, not as scalars in one linear dimension, but as forces pulling away from each other orthogonally. Thus we get, for any item from the list above, a two-dimensional picture, where we can plot resulting movement according to different forces on the two axes.

Nor, I may add, is there any need to stop at two dimensions. The principle at play is not two-dimensionality, but *orthogonality*. Once you have departed from a linear model by positioning your axes orthogonally, you can have as many dimensions as you like.

Now let me say something about transdisciplinarity. I agree that it means more than multi-disciplinarity, and also more than cross-disciplinarity. It certainly means *transcending* disciplinarity. What I am suggesting is that this transcending of disciplinarity involves rising above not one, but two, Aristotelian precepts. We must rise above the Law of the Excluded Middle, by replacing "either/or" by "and/and". That is necessary, but it is not sufficient. We must also rise above the simplistic application of the Principle of the Mean when we encounter a juxtaposition of apparent opposites. To unleash the creative energy locked up in such juxtapositions we should adopt a dynamic rather than a static model. And this can be done by thinking in terms of forces on orthogonal axes.

In conclusion, let me link these comments to my vision for Stellenbosch University. In saying that Stellenbosch University should transcend its past, I do not mean to issue only a repudiation of our historical connection with the development of apartheid. I also mean to challenge our use of, and dependence on, two key concepts of Western rationality: the exluded middle, and the Golden Mean. Perhaps apartheid was the ultimate political application of the law of excluded middle – everything, and everybody, was either black or white, with nothing in between. That time is over now. But we have some more work to do. We are – and when I say "we" I refer here specifically to the University – still locked into another Aristotelian paradigm, which predisposes us towards treating apparent opposites linearly, instead of orthogonally.

Both in the sense of rising above our past, and in the sense of rising above the stereotypical juxtapositions of apparent opposites, I believe we can say that we are commited to transcending disciplinarity.

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