ISSN 1865-8032

10

Dezember 2012
Dharma, Science und Favela

Briefe zur Interdisziplinarität

Eine Publikation der
Andrea von Braun Stiftung

voneinander wissen

Vorwort

Die Ihnen vorliegende zehnte Ausgabe der Briefe zur Interdiszplinarität unterscheidet sich in zwei wesentlichen Aspekten von den vorhergehenden neun. Zum einen: Während wir sonst typischerweise über sechs bis neun Projekte berichten, sind es diesmal nur zwei, diese jedoch in größerer Tiefe als sonst. Zum anderen: Der weitaus größte Teil der Ausgabe ist auf Englisch. Beides hängt zusammen. Das erste Projekt betraf eine Vielzahl von Personen aus einer Reihe von Ländern, deren einzige begrenzt gemeinsame Sprache Englisch war, das letztere ging nur von einer einzigen, allerdings englischsprachigen Person aus, die ihren Beitrag mit unserem Einverständnis auf Englisch verfasste, obwohl es um ein Projekt in Brasilien ging.

Das klingt alles ein bisschen verwirrend, darum der Reihe nach.

Im September 2009 nahm ich in Plön am Global Economic Summit teil (ein jährlich stattfindendes Ereignis vergleichbar dem Davoser Forum, aber ohne den Medienrummel). Ich kam dort ins Gespräch mit Richard Ernst, ETH Zürich und Gewinner des Nobelpreises für Chemie im Jahre 1991. Prof. Ernst erzählte von einem ungewöhnlichen, höchst interdisziplinären Vorhaben, *„Science Meets Dharma“*[1], das auf eine Initiative des Dalai Lama zurückgeht und darauf zielt, tibetischen Mönchen in diversen Exilklöstern in Indien den Zugang zu westlichen Naturwissenschaften eröffnen. Mir kam der Gedanke, dass ein solches Vorhaben ideal zur Andrea von Braun Stiftung passen könnte. Eine unserer Grundannahmen geht ja davon aus, dass dort, wo ganz disparate Gedanken und Erfahrungen zusammentreffen, oft Unerwartetes und gänzlich Neues entstehen kann. Mich faszinierte der Gedanken, wie man sich eine Diskussion zwischen buddhistischen Philosophen und westlichen Naturwissenschaftlern vorstellen und was dabei herauskommen könnte.

Den Dalai Lama bewegen allerdings andere Überlegungen. Tibet war vor der chinesischen Besetzung im Prinzip ein an religiösen Grundsätzen orientierter Staat mit einem sehr hohen religiös aktiven Bevölkerungsanteil. Anders als im tibetischen Mutterland hat sich das unter den Exil-Tibetern bis heute halten können. Etwa ein Viertel aller Exil-Tibeter (ca. 150.000) sind Mönche. Sie leben zum weitaus größten Teil in einer Reihe von Klöstern in Indien. Der Dalai Lama befürchtet, dass auf die Dauer das tibetische Volk in der Fremde seine Identität, seine Kultur, Sprache und Tradition verlieren wird, wenn es nicht gelingt, die Tibeter in ein eigenständiges 21. Jahrhundert zu bringen. Die Kenntnis und die Auseinandersetzung mit den westlichen Wissenschaften soll hierzu ein Mittel und die Geistlichen könnten hierfür das geeignete Vehikel sein.

[1] *Im Buddhismus beinhaltet Dharma als das vom Buddha erkannte und verkündete Daseinsgesetz die Lehre von den Vier Edlen Wahrheiten und bildet in der Zufluchtsformel „Ich nehme Zuflucht zu Buddha, Dharma und Sangha“ eines der Drei Juwelen. Darüber hinaus ist das Wort unter Buddhisten in seiner Pluralform „Dharmas“ als Sammelbezeichnung für die Gesamtheit aller Phänomene gebräuchlich. (Wikipedia, abgerufen 4.3.2011)*

Das ist allerdings ein hoher Anspruch. Die Mönche und Nonnen durchlaufen einen zwischen 18 und 25 Jahren dauernden Ausbildungszyklus, in dem sie sich ausschließlich mit buddhistischer Philosophie befassen. Am Ende steht die Ernennung zum „Gesche", grob vergleichbar mit einem Doktor der Philosophie. Sie wissen wahrscheinlich alles über die buddhistische Philosophie, haben aber nie so etwas wie einfache Prozentrechnung, den Dreisatz, das Periodensystem der Elemente oder Grundsätze der Elektrik gelernt. Ich war sehr skeptisch. Die Welten lagen sehr, sehr weit auseinander. Mir kam es vor wie der Versuch, eine Antilope zu einem Gespräch mit einem Walfisch zu bringen.

Und doch, es geht. Seit neun Jahren unterstützt eine schweizerische Hilfsorganisation die Entsendung von Lehrern und Fachleuten nach Indien. Sie arbeiten mit einfachsten Mitteln, einem PC und Beamer, kleinen Versuchsaufbauten, Exkursionen ins Feld, Vorträgen und Diskussionen. Ich sah im südindischen Karnataka, wie die Mönche in ihren bordeauxroten Roben auf dem Boden saßen und atemlos, manchmal ungläubig, den Ausführungen meist junger Studenten über Astronomie, über geologische Strukturen und Prozesse, über Vererbungslehre und Zoologie folgten. Der Big Bang, der Anfang von ALLEM, hatte es ihnen besonders angetan, aber auch mit Neurologie konnten sie viel anfangen. Unsere Stiftung hat sich gemeinsam mit dem Tibet Institut Rikon (Schweiz) daraufhin entschlossen, eine Gruppe westlicher Wissenschaftler und tibetischer Gesche zu einer zehntägigen Diskussionsrunde in Bangalore einzuladen, die im Herbst 2011 stattfand. Über diese Begegnung berichtet das nachfolgende Lernpapier, zu dem viele beigetragen haben und das von einem externen Beobachter, Alexis Dworsky, einem früheren Stipendiaten unserer Stiftung, mit einem Kommentar begleitet wurde. Von allen Teilnehmern lesen Sie hier die persönlichen und fachlichen Erfahrungsberichte, die wir wegen ihrer Vielfalt in ihrer ganzen Breite wiedergeben. Der Bericht beginnt mit einer Übersicht der Veranstaltung.

Das zweite Papier stammt von der amerikanischen Architektin Kristine Stiphany („*Learning on the Ground: Co-Created Knowledge from the Bamburral and Arvore São Tomas Favelas in São Paolo, Brazil*"). Sie beschreibt in ihrem Lernpapier die vielleicht überraschendste Quelle von Wissen und Erkenntnis, die wir in allen von der Andrea von Braun Stiftung geförderten Projekten bisher hatten: die Kinder in den Favelas (im Deutschen oft als Elendsviertel betrachtet, lokal jedoch lediglich als „informelle Ansiedlung" definiert). Frau Stiphany vollzieht eine geistig mutige Kehrtwende. Die Kinder werden in Ihrer Dissertation nicht als Probleme angesehen, sondern als die Träger von Wissen zur Lösung von Problemen. Sie hat in ihrem Learning on the Ground Project die Kinder mitgenommen, ihre Kreativität stimuliert und ihre Erfahrungen und Erkenntnisse genutzt, um neue Ansätze für die lokale Entwicklung in den brasilianischen Siedlungs- und Bildungsstrukturen zu identifizieren.

Wissen ist überall, in den tibetischen Klöstern in Indien oder den brasilianischen Favelas. Man muss es nur finden und nutzen.

München, im Dezember 2012

Dr. Christoph-Friedrich v. Braun, M.Sc.
Vorstand, Andrea von Braun Stiftung

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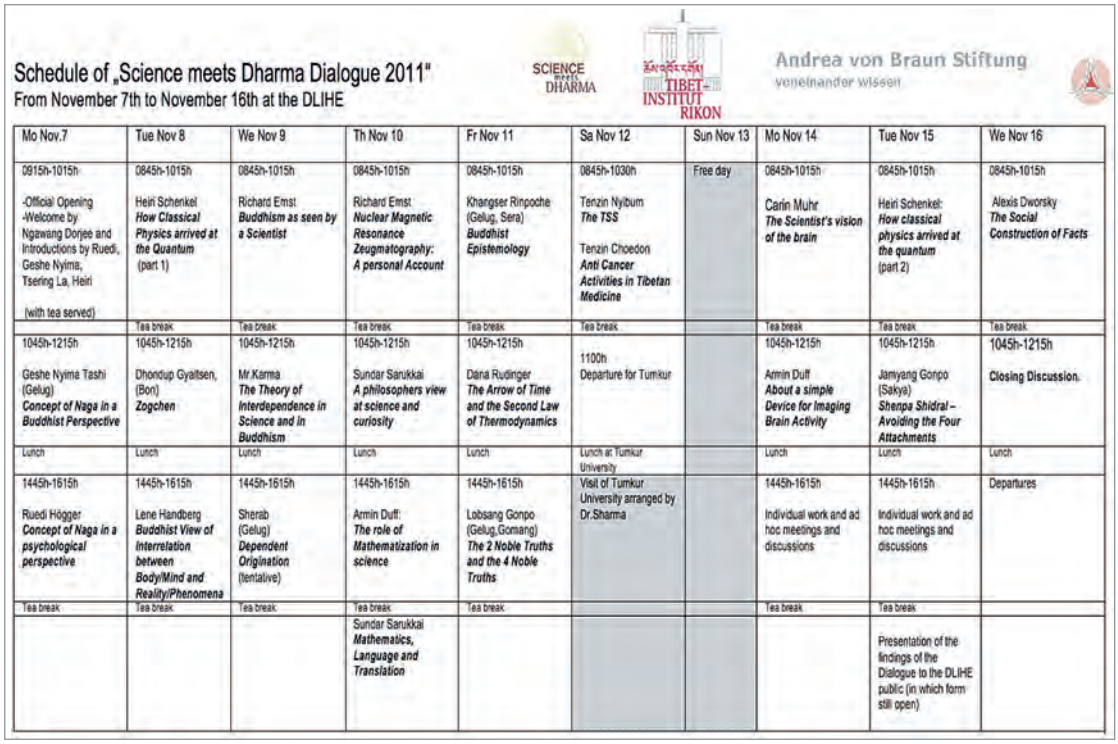


Schedule of „Science meets Dharma Dialogue 2011"
From November 7th to November 16th at the DLIHE

SCIENCE meets DHARMA

TIBET-INSTITUT RIKON

Andrea von Braun Stiftung
voneinander wissen

Mo Nov.7	Tue Nov 8	We Nov 9	Th Nov 10	Fr Nov 11	Sa Nov 12	Sun Nov 13	Mo Nov 14	Tue Nov 15	We Nov 16
0915h-1015h -Official Opening -Welcome by Ngawang Dorjee and Introductions by Ruedi, Geshe Nyima, Tsering La, Heiri (with tea served)	0845h-1015h Heiri Schenkel ***How Classical Physics arrived at the Quantum*** (part 1)	0845h-1015h Richard Ernst ***Buddhism as seen by a Scientist***	0845h-1015h Richard Ernst ***Nuclear Magnetic Resonance Zeugmatography: A personal Account***	0845h-1015h Khangser Rinpoche (Gelug, Sera) ***Buddhist Epistemology***	0845h-1030h Tenzin Nyidum ***The TSS*** Tenzin Choedon ***Anti Cancer Activities in Tibetan Medicine***	Free day	0845h-1015h Carin Muhr ***The Scientist's vision of the brain***	0845h-1015h Heiri Schenkel: ***How classical physics arrived at the quantum*** (part 2)	0845h-1015h Alexis Dworsky ***The Social Construction of Facts***
Tea break	Tea break	Tea break	Tea break	Tea break	Tea break		Tea break	Tea break	Tea break
1045h-1215h Geshe Nyima Tashi (Gelug) ***Concept of Naga in a Buddhist Perspective***	1045h-1215h Dhondup Gyaltsen, (Bon) ***Zogchen***	1045h-1215h Mr.Kerma ***The Theory of Interdependence in Science and in Buddhism***	1045h-1215h Sundar Sarukkai ***A philosophers view at science and curiosity***	1045h-1215h Dana Rudinger ***The Arrow of Time and the Second Law of Thermodynamics***	1100h Departure for Tumkur		1045h-1215h Armin Duff ***About a simple Device for Imaging Brain Activity***	1045h-1215h Jamyang Gonpo (Sakya) ***Shenpa Shidral – Avoiding the Four Attachments***	1045h-1215h **Closing Discussion.**
Lunch	Lunch	Lunch	Lunch	Lunch	Lunch at Tumkur University		Lunch	Lunch	Lunch
1445h-1615h Ruedi Högger ***Concept of Naga in a psychological perspective***	1445h-1615h Lene Handberg ***Buddhist View of Interrelation between Body/Mind and Reality/Phenomena***	1445h-1615h Sherab (Gelug) ***Dependent Origination*** (tentative)	1445h-1615h Armin Duff: ***The role of Mathematization in science***	1445h-1615h Lobsang Gonpo (Gelug,Gomang) ***The 2 Noble Truths and the 4 Noble Truths***	Visit of Tumkur University arranged by Dr.Sharma		1445h-1615h Individual work and ad hoc meetings and discussions	1445h-1615h Individual work and ad hoc meetings and discussions	Departures
Tea break	Tea break	Tea break	Tea break	Tea break			Tea break	Tea break	
			Sundar Sarukkai ***Mathematics, Language and Translation***					Presentation of the findings of the Dialogue to the DLIHE public (in which form still open)	

Science meets Dharma Dialogue 2011

Curricula and Individual Feedbacks of participants. Abstracts of presentations and two written contributions

Dr. B. Tsering, biologist, Dharamsala, India. Dr. Alexis Dworsky. Dr. Armin Duff, physicist, Barcelona. Dr. Carin Muhr, neuroscientist, Stockholm. Dr. Lene Handberg, psychologist, Copenhagen. Dr. Richard Ernst, Nobel Laureate, Winterthur, Switzerland. Dr. Sundar Sarukkai, Manipal University, India. Dr. Ruedi Högger, historian, Langenbruck, Switzerland. Dr. Dana Rudinger, physicist, Zürich, Switzerland. Heiri Schenkel, M.Sc., M.Ed. Dhondup Gyaltsen, monastic of Bon Tradition. Jamyang Gonpo, monk of Sakya tradition, Mundgod, India. Lobsang Gonpo, monk of Gelug tradition, Mundgod, India. Some sketchy items. Dr. Beat von Scarpatetti, historian, Basel, Switzerland. Lobsang Nyima, archeologist and Buddhist monk, Tashi Lhunpo Monastery, India

Art des Projektes: *Pilot Geshe Kurs November 7–16, 2011 at the Dalai Lama Institute of Higher Education DLIHE, Bangalore, India*

B. Tsering, Ph.D. in Biology, Dharamsala, India

The most important learning from the Dialogue for me was that Contemporary Science and Buddhism are both sciences in search of reality using different tools, external in contemporary sciences and inner self in the case of Buddhism. Both sciences are looking for ways to make this world a better place to live in for human beings.

The contemporary sciences are constantly inventing more and more sophisticated tools in their quest for ways to change this world to suit the needs of human beings and in this process they may end up being the cause of wiping the human beings from this planet! On the other hand, the kind of work that Carin and others are doing is forcing the hard scientists to pause and hear what the inner science is saying. It was also great to learn from Neural Science that stem cells are found in the brain, which then encourages us to work on our brain and mind.

In a nutshell, if Science is physical, religion is for the mind, if science is for material development, Buddhism is for inner development, if Science is for the body, Buddhism is for the mind, if Science is for physical comfort, Buddhism is for inner peace. Therefore, both are important if they are well balanced. Definitely more dialogue is needed between the people from these two backgrounds.

Alexis Dworsky, Ph.D., Munich, Germany: Observer

C.V. and Fields of Interest

After studying fine arts I have written my doctoral thesis; it was tutored by Bazon Brock (aesthetics) and Ludwig Trepl (ecology). The Topic was the cultural history of the dinosaur. Therefore I have examined how scientific facts are socially constructed, how society affects science and vice versa—how our image of the world is created.

Abstract of Presentation

I am going to document the meeting in India. My presentation might be separated into two parts. In the first part I would like to show how the way of seeing facts has changed all the time. I am going to illustrate this with my personal topic of research, the image of the dinosaur. Based on this I might be able to show that science and spirituality are not the only ways to search for the truth and that objectivity also has a historical component. In the second part I would like to talk about our meeting. I am going to show how my own view about scientists and Buddhist monks has changed within these ten days.

Feedback

In contrast to the other participants of the meeting I had little knowledge about what Buddhism is: one day in Rikon, one day in Sera, a few pages of the Universe in a Single Atom. That was all. Of course living in a western society, I knew much more about science in general, about science from the point of view of my daily life. However, physics and chemistry, the so-called hard sciences, were widely unknown to me. The last time I heard about math was 20 years ago in school.

We have attended many lectures and so I got a lot of information. On the one hand, I have learned at least a little bit about the spectrum of light, about firing neurons and even about Zeugmatography. On the other hand, I have learned about the Four Noble Truths, the Naga and the concept of emptiness. But was it really necessary to travel to South India for this? We were told that the Buddha not only knew the answer „Yes" and „No" but also knew a third possibility: „No Answer". Here I might choose this third answer. Maybe few hours in front of the computer, surfing in Wikipedia would have also offered some knowledge about science and Buddhism to me. If I had spent several days in the library, I might have even known more about these things.

However, I have to point out clearly that joining the meeting was definitely worth 8.000 kilometres of travelling! That may sound paradox, but it is not at all. That is because learning from each other does not mean getting second hand information. It also means learning to know each other. And that is where dialogue starts.

Geshe Nyima Tashi, one of the Buddhist monks, told us that we are all human beings, whether we are a Tibetan monk or a western scientist. Of course that is nothing new – on a level of knowledge. But on a level of experience I had to learn it by myself. That Buddhist monks as well as scientists are just people like me, sounds so simple. But to me it was an important discovery I had to make on my own, a discovery I would not like to miss.

Armin Duff, Ph.D. in Physics, Barcelona, Spain

C.V. and Fields of Interest

During my studies in Physics at the Swiss Federal Institute of Technology (ETH) in Zürich I was acquainted with the field of computational neuroscience for the first time. In my PhD I investigated how intelligent systems extract and learn the rules and regularities of the world in order to act autonomously. In particular I developed a self-contained autonomous model for sensory motor learning and planning. Currently I am a post-doctoral researcher at the SPECS laboratory at the Pompeu Fabra University in Barcelona. My research is focused on evidence-based, neuro-scientifically grounded rehabilitation for

stroke. Based on our knowledge of the brain dynamics underlying action execution and perception we developed and tested a virtual reality based rehabilitation system called Rehabilitation Gaming System (rgs-project.eu).

Abstracts

1. The role of mathematization in science: Mathematics lies at the very core of science. From a strict point of view one can claim that science only regards phenomena that are measurable, regular, and can be described in a formal (mathematical) way. In a first part I will explore the origins of mathematics and its application to science. In particular I would like to emphasize the properties of natural phenomena that render the mathematization of natural phenomena possible. In a second part I will address the limits of the mathematical method to describe the dynamics and functions of the brain such as perception, decision-making and consciousness.

2. About a simple device for imaging brain activity: An essential step towards understanding nature is observation. Recent developments in neuro-technology allow us to gather more and more precise data on brain dynamics. For the seminar I will bring along a device called EPO that allows measuring the electric signals produced by the brain. During the week you can try it out yourself and participate in a simple neuro-feedback experiment.

Feedback

The ten days of dialogue where full of new impressions and impulses. As for now it is difficult to see what effect it will have on my professional and personal life. What I can say at the moment is that already now it impacted my view on Buddhism, science, Christianity and life in general. After all, and this I learned these days, a change of view is the first step towards happiness.

The dialog was my first close encounter with Buddhism. Although I had some basic knowledge it is in the dialogue I could get a first glimpse on the multi-faceted Buddhist philosophy. Although most of the concepts where known to me I soon realized that I hardly understood their many levels of meaning. Only after intense discussions in the lecture hall and at the tea table I slowly got to grasp some of the most basic concepts. But than again and again, just in the moment where I was able to somehow order my ideas and make sense of what I heard, I learned that there is yet another facet that we had not yet considered. Although my understanding is still very basic, I can appreciate more and more the deepness and richness of Buddhist philosophy.

The intense discussion on topics from natural sciences allowed me to get a critical view of the method we apply day by day. Buddhist monks ask different questions than physics students and thus demand different thinking. In particular I was affected by the tight catenation of ethics and truth in Buddhist philosophy.

One of my most important insights of the dialogue is that significant differences only exist on a superficial level of understanding. If we get a deeper understanding between the different religions such as for example Buddhism and Christianity we find more and more similarities. I do not claim that all religions are ultimately the same but I learned that if we try to understand the most basic or constituent concepts we find a lot of common ground. The dialogue not only offered an insight into Buddhism but also helped me to better understand my own background.

Time will show if after all the change of view will lead me to more happiness.

Carin Muhr, Ph.D., Neuroscientist, Sweden

C.V. und Fields of Interest

Along with my clinical specialization as a neurologist at Uppsala University Hospital, Sweden, I worked on my PhD mainly focusing on Neuroendocrinology and interactions between hormones and the brain. Since then I have been active with research on brain tumors, headache and stress, and teaching and clinical work at the University hospital. I also enjoy working with international research and pedagogical projects in India, Peru and the West Indies and have been responsible for student and faculty exchange. To an increasing degree my aim has become to understand the fascinating complex function of the brain and interrelated nature with the mind (whatever this might be) and the body and the studies of Unity in Duality Buddhist philosophy have increasingly opened my mind and challenged me to learn and to understand more.

Abstract

Modern neuroscience has developed immensely within the latest decades and through technological advancements has been able to study brain structure and function in more and more detail. However, the more complex the models the more there is a need for a holistic and „open minded“ perspective to be able to reach further progress in the medical world to truly benefit humanity. I will discuss some of the recent findings in neuroscience which might play a role for how we can think about the brain and the mind like epigenetics or neuroplasticity, also in relation to mindfulness, and I will discuss mental health. I am looking forward very much to have these ideas considered and discussed in relation to Buddhist science.

Feedback

Firstly I would like to thank you all for a really interesting and wonderful time together. My reflections from the dialogue have continued to evolve since we met. I am convinced that our dialogue „Science meets Dharma" constituted an important meeting and enhanced understanding and communication between all of us, scientists from so many disciplines and with very diverse experiences and backgrounds. Meeting with the Buddhist philosophy through "Unity and Duality" during the last years has given me valuable and important new insights in my own field of neuroscience. To me „Buddhist philosophy and inner science is Neuroscience". Discussions at the Dialogue made it clear to me just like my research and many meetings within the scientific community that there is an immense need for further and deepened exchange of perspectives - or so called „realities"- to increase our awareness.

I would like to summarize my thoughts by citations from the book Practical Applications and Scientific Proof - Energy Medicine by Dr Norman Shealy. Dr Shealy is a neurosurgeon, psychologist and founding president of the American Holistic Medical Association and has written many articles and books also to incorporate alternative medicine into conventional medicine.

Dr Shealy quotes St. Theresa Rohit Meta who stated that „There are indeed fundamentally two categories of knowledge: Knowledge by Ideation and Knowledge by Being. All scientific knowledge, whether physical or super-physical, belongs to the first category. Such knowledge by Ideation is based on the duality of the observer and the observed. In spiritual perception, however, there is Knowledge by Being – it arises in that state where the duality of the observer and the observed has vanished. This is the very core of direct or what is otherwise called the Mystical experience that is." My reflection would be that „Knowledge by Being" would represent Buddhist Inner science while „Knowledge by Ideation" would more represent modern science.

One further quote, by Albert Einstein, „A human being is a part of the whole, called by us the „Universe", a part limited in time and space. He/She experiences him/herself, his/her thoughts and feelings as something separated from the rest - a kind of optical delusion of his/her consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from the prison, widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty. Nobody can achieve this completely, but the striving for such achievement is in itself a part of the liberation and a foundation for inner security." Furthermore, the physicist Niels Bohr said „The development of atomic physics, which forces us to an attitude toward the problem of explanation recalling ancient wisdom, that when searching for harmony in life one must never forget that, in the drama of existence, we are ourselves both actors and spectators." These quotes embrace further important issues, of which one essential is interrelatedness that we often discussed intensely during the dialogue. Finally, I would like to end with the interesting and fascinating concept of quantum mechanics stating that the conscious observer is key to the outcome.

Ref.: Norman Shealy: Practical Applications and Scientific Proof – Energy Medicine. 4th Dimension Press, VA, USA, 2011. ISBN 978-0-87604-610-4

Lene Handberg, Psychologist and Buddhist Scholar, Copenhagen, Denmark

C.V. and Fields of Interest

Studied Psychology in Copenhagen University, and with Lharampa Geshe Tarab Tulku XI for 25 years, 15 of which as Rinpoche's assistant. Tarab Rinpoche developed the modern version of advanced Buddhist teachings Unity in Duality / Tendrel, extracting universalities beyond culture and faith. When Tarab Tulku in 2004 went, he handed Lene the responsibility for UD teachings. Educational director of Tarab Institute International, with UD Trainings at Institutes in Germany, France, Holland, Slovakia and India (Tarab Ling, a UD Study and Research Institute being build, Dehradun) disseminating UD and with contemporary science investigating its application.

***Abstract:** „Buddhist view of Interrelation between Body – Mind and Reality / Phenomena"*

My point of departure will be UD / Tendrel, as formulated by Lharampa Geshe Tarab Rinpoche, in terms of pointing out the interesting knowledge in Buddhist Inner Science of the interrelated nature of subject (awareness/mind) – object (reality perceived), body – mind as well as energy (potential field) – matter, including elaboration on essential epistemological questions. The presentation of these aspects of inner science will be done with relation to contemporary science.

Feedback

• First of all my sincere thanks for inviting me to participate in this very interesting pilot project of Science meets Dharma, initiated by the well functioning organizing committee from Rikon in Switzerland. It has been a great pleasure and an extraordinary experience of meetings between persons seemingly of extreme positions.

• Secondly I should note the special position I had in the pilot project as a person-in-between, as I am western but has been engaged throughout many years with the Buddhist view in terms of its 'inner science' in a somewhat more modern expression than represented by the Geshes from the monastic tradition, which gave me a special position in the pilot project as neither speaking from a monastic view nor from the point of view of a western scientist. Because of that, especially in the beginning, my position seemed to some extent to be helpful in making a bridge, particularly concerning the oftentimes not adequate English translations of essential terms, which without further explanations could have been a hindrance for a communication without misunderstandings; and maybe also in regard pointing to Buddhist 'inner science' views that have obvious meeting points with contemporary science.

• The initial motivation from contemporary science and 'inner science', i.e. Buddhist, for seeking a dialogue was well meant, intentionally open but rather reserved with strong identification of the respective camps and frames of reference, which made the beginning positions a bit stiff – placing the other party in a rather extreme position of being either scientific or none-scientific.
• The initial emotional reactions/barriers of both Buddhists and Scientists in exposing themselves to the 'other world' could be said to be dominated by preconceived ideas of the other. In general the other world was seen as best to be complementary by the scientists but some, even while they questioned their position all together, saw the other as not belonging to their world or paradigm, but interesting.
• The scientific concepts showed to be more or less easily conveyed to and understood by the monastics, but not really assimilated with their Buddhist world view: in the beginning in particular there was a lack of reflecting the scientific view into the Buddhist view or in other words, of identifying the aspects of Buddhism that could furnish a meeting between the two or of investigating where in Buddhism there are similar objects of investigation as in contemporary science: 'inner science' / nang dön rig (in Tibetan).
• Here I think it is important for future meetings to reflect on the fact that Buddhism has many faces and many ways of being presented: religious and culturally determined ways; practical-moralistic ways; literal non-reflective presentations of the inner science; and more reflective to deeply dynamic ways of presenting. In accordance with the latter two positions it seems thus to be possible to extract a Buddhist 'inner science', which is based on investigations (using inner i.e. body-mind awareness tools) and which in accordance with Buddha Sakyamuni should be subject to change if and when the repeated investigative results or the senses or valid logically based inferential knowledge should show otherwise.
• To what extent Buddhist concepts and practices could be conveyed to and understood by scientists in this project is difficult to say. It seemed to depend largely on a fitting 'translation' of the Buddhist terms into a more commonly agreed upon language.
• I would say that a fitting consensus seemed to appear during the process of the pilot project, particularly as people from the two parties were meeting and discussing in smaller groups, getting more into that which the 'foreign' terms would point to furthered by the two parties' meeting face to face (person to person) on a feeling level and not just through abstract concepts.
• To which extent it was possible for the Buddhists monastics to adopt a historical and critical approach to their tradition is certainly possible but depends on the person – however, I think some monastics would basically not be interested in this endeavour – whereas for others it would be more easy, as they would wish and dare to ask questions to the system in which they have been educated, remembering that fundamentally Buddhism has a deeply critical approach manifested by Buddha Sakyamuni, who was a real reformer openly telling that one should never just believe anything told, but test everything for one-self.
• In this pilot project we had very little exposure to Buddhists' explaining contemplative experiences of introspection. Only in the end group discussion on 'what denominates science' (in

which scientists from different part of Europe were not in agreement – some had a more narrow hard-core-scientific view and others a much wider view) both the contemplative / meditation experiences / knowledge about body-mind and reality and their interrelations was here presented as repeatable and shareable and the whole investigative Buddhist system was presented as having a strict methodology, so in that sense it was openly embraced by most scientists present. A great opening and meeting was apparent in this discussion – of course prepared by all the small openings all along the process during this 10-day pilot project.

• I certainly feel that this pilot project has opened up for recognizing the values of the more intuitive, non-conceptual methods of self-inquiry to help transforming society so that it could become more respectful towards nature and preventing human suffering as well as recognizing the values of human openness, love and compassion as a very important attitudes of the members of a society for living together in harmony.

• I think that it is very important on both sides to deeply reflect on and present to what the terms we use really refer, so that we get into contact with the reference of the terms and do not get caught up in the abstract ideas that refer to different things in different cultures. So yes, I think the language barrier hampers the dialogue, but in a different way than is usually imagined. This happens because Tibetans have learnt that certain English terms are the translations of certain Tibetan terms, which is not at all evident when we go a bit deeper. Here we have to know that the Tibetan dictionaries that are often the basic resource for translations were written by missionaries, whose main aim was to translate the bible into Tibetan. This continues to cause big translation and understanding problems.

• Personally I was at times confused about one point: Was this meeting a meeting of science and dharma or a meeting of scientists and monastics? Maybe both! I think that this point should be clear from the beginning of a new meeting and would help clarify discussions.

• From our discussions it seemed as if there were many important common features in analytical psychology and Buddhism.

• Another common basis of the ‚inner' and contemporary science is: The search for knowledge about reality, and that the findings are applicable and communicable to others. Also both sciences start their investigations from the sense realm and probe deeper and deeper into matter nature – inner science in interrelation with its investigations into mind and its nature.

• A final common basis we discussed in the context of the pilot project is the common acknowledgement of the subject and object interrelation – ‚inner science' here understands the subject to be the particular mind faculty used in each perception and the object as being of two types, the object-pole (object appearance) and the referential object – both sciences acknowledging that we can never experience / get to the truth of the referential object but only deduct certain laws of nature, which we cannot prove to be right, but only falsify and through this process further refine – opening up for the ongoing creative investigative attitude fundamental to the Buddhist's ‚inner science' and to contemporary science (acknowledged but not always implemented in either of the two scientific fields).

• Concerning topics for a future „Science meets Dharma meeting": I think that the topic of

'interrelated nature' (sometimes translated to 'dependant origination') / tendrel or tenjung (in Tibetan) especially regarding subject (minds) and object (reality) interrelation as well as matter and energy (including potential field) interrelation, and body and mind interrelated nature would be the most suitable and most revealing topics for a future meeting, especially when considering how the understanding of these ideas could be the base for a change in attitude towards the way we exist in our respective societies and in the world as a whole – opening up to realization of how deeply interrelated and interdependent we are among ourselves and with nature.

Let me finish with great thanks to all of the other participants for furthering the good and deep friendships that were the outstanding result of this pilot project, which I am sure have laid the basis for an ongoing real communication – this being the actual topic of the pilot meeting I believe. In the end I should like to thank our organizers, who did a great job all through and especially to thank the donor without whose great support we would not have had any meeting whatsoever.

Dr. Richard Ernst, Nobel Laureate 1991 in Chemistry

C.V. and Fields of Interest (taken from Wikipedia)

After he had finished high school, Richard Ernst started to study chemistry at the famous Swiss Federal Institute of Technology in Zurich (ETH Zurich) with high expectations and enthusiasm. But he was disappointed by the state of chemistry in the early 1950s as it was taught at ETH Zurich; the students had to memorize uncountable facts that even the professors did not understand. The physical chemistry lectures did not reveal much insight either, they were limited just to classical thermodynamics. So, Ernst had to return to reading in order to get the knowledge he wanted. He often read the book Theoretical Chemistry by S. Glasstone. In it he learned about the fundamentals of quantum mechanics, spectroscopy, statistical mechanics, and statistical thermodynamics. He studied and served as faculty at ETH Zurich, Switzerland, from which he is now retired. He is Honorary Doctor of the Technical University of Munich and the University of Zurich. Ernst received both his diploma in chemistry (1957) and his Ph.D. in physical chemistry (1962) from ETH Zurich.

Discoveries

From 1963 to 1968 he worked as a research chemist in Palo Alto, California. In 1966, working with an American colleague, Ernst discovered that the sensitivity of NMR techniques (hither-

to limited to analysis of only a few nuclei) could be dramatically increased by replacing the slow, sweeping radio waves traditionally used in NMR spectroscopy with short, intense pulses. His discovery enabled analysis of a great many more types of nuclei and smaller amounts of materials.

In 1968 he returned to Switzerland to teach at his Alma Mater. He was made assistant professor in 1970 and full professor in 1976. His second major contribution to the field of NMR spectroscopy was a technique that enabled a high-resolution, „two-dimensional" study of larger molecules than had previously been accessible to NMR. With Ernst's refinements, scientists were able to determine the three-dimensional structure of organic and inorganic compounds and of biological macromolecules such as proteins; to study the interaction between biological molecules and other substances such as metal ions, water, and drugs; to identify chemical species; and to study the rates of chemical reactions.

Richard Ernst had three presentations at the Science meets Dharma 2011 Workshop in Bangalore, one of which was for the students at the DLIHE. Here we include the presentation in which he reflected on the human and psychological aspects of a life as a scientist. The following texts summarize his contributions.

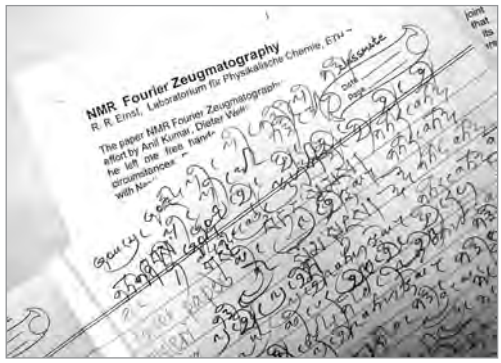
Abstracts

Abstract 1: *Western and Buddhist Concepts of Physics and Metaphysics. A Personal View of an Inept and Biased Western Scientist.*

The mathematical foundations of Western Physics are contrasted with the spiritual concepts of Buddhism. While the former lead to the possibility of accurate predictions and analysis of scientific experiments and to a quantitative understanding of nature, the latter concentrate on grasping the „essence" of nature without any quantitative outcome but with providing a qualitative sense of comprehension in philosophical terms. Western physics and science are excellent foundations for technology and for solving the material problems of our world. Buddhist natural philosophy, on the other hand, is of little use for addressing questions of technology and technological science as it abstains from all quantitative aspects such that computations are impossible and quantitative optimization and comparisons are out of question. It is characteristic that Buddhist 'science' concentrates on the mind and on mental processes. In other words, Buddhist 'science' addresses questions that are today very difficult or even impossible to answer by Western science. In this way, Buddhist 'science' avoids conflicts with Western science. Western science claims to comprehend and to be able to quantitatively formulate the basic laws of nature in the form of mathematical concepts. But very often, the resulting equations are too complicated to be solved with mathematical accuracy. Western science starts invariably by doing experiments and confronting experimental results with theoretical concepts, either to verify or to reject them. In Buddhist 'science', physical experiments are hardly ever conducted, and one relies entirely on one's own mind and on spiritual experiences for explaining the 'inner

world', hoping for some congruence of inner and outer worlds. In this sense one may claim complementarity of the two approaches.

Abstract 2: *(of the presentation for the general public, students and professors of DLIHE)*
My Personal Pathway into Science and Beyond: Ups and Downs in the Life of a Western Scientist. This lecture provides a vivid narration of my own pathway from the beginning as a somewhat retarded child to a Nobel laureate. I learned from the start that the major obstacles in life are not presented by human „adversaries", but by personal limitations of myself. In trying to overcome these personal barriers, one can mobilize forces that may lead to surprising achievements. I had the great luck to be able to contribute to the advancement of Magnetic Resonance Imaging, a marvelous tool for measuring mental activity. I was interested from the beginning in divergent fields of science and of the arts. Besides chemistry, I developed a strong interest for music, providing me with experiences of my inner self, discovering a realm that contrasted with my experiences in chemistry. Later, I encountered Buddhist art that became a highly important source of inspiration for me. Fortunately, I also found bridges between science and Tibetan art in the form of a physicochemical analysis of pigments in Nepalese, Tibetan, and Mongolian scroll paintings (thangkas), using Raman spectroscopy. In this way, the circle of experiences is closing again, bringing together Western technology and Buddhist spirituality.



Abstract 3: The circumstances of Conceiving the Idea of NMR Fourier Zeugmatography, 1974. A case study of conceiving a novel idea in the sciences is presented: NMR Zeugmatography. During an inspiring lecture by Paul Lauterbur, at a conference in the US, a highly promising idea came to my prepared mind. A few days later, I was writing down the novel idea that led then to a patent application, to lectures, and to publications. It also helped towards winning a Nobel Prize, although it was not cited directly in that context. The method that was later called Fourier Magnetic Resonance Imaging (Fourier MRI) became highly important for further developments in MRI. Today it is used inherently in virtually all MRI methods. Two essential factors leading to this invention were (i) an „inspiring lecture", i.e. an outside „kick" starting a mental process in my brain and (ii) a „prepared mind" as I was working at that time on related experiments of „two-dimensional NMR". The coincidence of the two factors led to the possibility of a relevant invention. In the lecture, I will explain the method in detail. I „sold" the patent for 200 US$ to the company Varian Associates in Palo Alto, California, whose consultant I was. Varian probably earned several 100 million Dollars from this patent, while I remained as „poor" as before. But the experience of having made a relevant contribution to mankind outweighs all missed financial remunerations.

Sundar Sarukkai, Ph.D., Head of Philosophy Dpt., Manipal University, India

C.V. and Fields of Interest

Sundar Sarukkai's research interests include philosophy of science and social science, phenomenology and philosophy of language and art, drawing on both Indian and Western philosophical traditions. He is trained in physics and philosophy, and has a PhD from Purdue University, USA. Besides having published numerous papers, he is the author of the following books: Translating the World: Science and Language, Philosophy of Symmetry, and Indian Philosophy and Philosophy of Science. His forthcoming books include What is Science? and The Cracked Mirror: An Indian Debate on Theory and Experience (co-authored with Gopal Guru). He is an Editorial Board member of the Leonardo Book Series, an influential series published by MIT Press on science and art and Member of the Council of the Indian Council of Philosophical Research. Presently, he is the Director of the Manipal Centre for Philosophy & Humanities, Manipal University.

Abstracted Version of Presentation

I. Science and curiosity

Why does one do science? From the psychological act of curiosity comes excitement, pleasure of discovering something new or beautiful. Curiosity is an important element of being human, it is the catalyst for questions about what something is and why it is and for thinking about the methods to answer them. In children curiosity seems to diminish as they grow older, while the ideal scientist is eternally curious. Einstein recommended not to stop questioning and never to lose a „holy" curiosity. Distinction has to be made between curiosity and doubt. It is interesting that Indian stories do not seem to emphasize negative aspects of curiosity as the Western tradition does, e.g. in the myth of the Pandora box, with Adam and Eve, etc. Plutarch recommends not to indulge in vulgar curiosity, but to direct it towards nature. For Christian tradition curiosity (and questioning) always was problematic and attaining knowledge other than through the Bible was misplaced. Augustine did not like the „lust for experimenting and knowing", curiosity was seen as a temptation, a vice like vanity or pride. So curiosity was narrowly guided by traditional ethical considerations, the moral status of the inquirer and of the knowledge gained was important.

II. The ethics of curiosity – Reinvesting responsibility in curiosity

The value given to curiosity by science and the freedom it entails, need to be questioned, if a meaningful ethics of science is at all to be possible. It must also be taken into account that the idea of curiosity is culturally and socially mediated, so that the choice of the meaning in the „semantic spread" (wonder, marvels, admiration, subtlety, rarity, etc) of the word „curiosity" is also cultural and to some extent arbitrary.

Curiosity is also a catalyst for action, for experimenting, as one can already observe in the sometimes cruel plays children play with animals. Science also wants to know how nature works and behaves by freely experimenting , without responsibilities or constraints. If science goes too far, ethics arises and says that curiosity must be limited – especially in biology, when living beings are involved. But what about e.g. particle physics? The recent drama in CERN, driven by the curiosity about the Higgs particle, is an indication that here also constraints are needed: Is it responsible to risk a, even maybe improbable, blowing up of the Earth just to satisfy curiosity to know our alleged material origins? How much can we trust the judgement of the interested scientists when they have to assess the probability of our own destruction and put their own research activity to question?

Not only scientists, also philosophers see curiosity as a virtue. As Baumgarten points out, the word itself is rooted linguistically in „curare", to take care of, and it can strengthen the caring relation to others and to nature. Curiosity also has a deontological status (de devoir) and it is a duty to live it, leaving out negative variants, like voyeurism etc. Curiosity according to Baumgarten[1] helps living well and supplies meaning in life.

Looking at the present state of the world we may ask how scientific „pure" curiosity is related to a caring attitude towards nature. How should science be regulated? When should we desist from curious things? This question becomes more difficult to answer when we consider cultural differences. In the Indian context e.g. we find rather doubt than curiosity, and evil effects of it are not mentioned, as is the case in Greek and Christian philosophy. In the Indian context it is difficult to find examples of pure curiosity, even mathematics was grounded more in practical concerns. It seems that ethics and metaphysics belong together, so a critique of pure, intellectual curiosity never was necessary.

Considering the hegemony of Western knowledge, it needs more effort to discuss the relation between ethics and science. It is not sufficient to adopt a consequentialist approach: Scientists will tend to shift the responsibility for the consequences towards those applying the results of their research: the politicians, the engineers, etc. So negative consequences alone are not a sufficient guideline for ethical restraints. We could ask: What are the necessary requirements before one can take on the role of an interrogator of nature? It is the society that has to decide: Everything we do in a social setting is moderated and constrained by social factors.

Artists don't need an ideology of curiosity, they rather create an ideology of pleasure to legitimize their work. However the call for freedom of the mind, i.e. freedom of expression and thought, is common to science and art. Usually though, through considering the consequen-

[1] *Alexander Gottlieb Baumgarten (July 17, 1714 – May 26, 1762) was a German philosopher in the tradition oft he enlightenment*

ces, this freedom is constrained by self-control. So, putting curiosity into the freedom discourse we realize that constraints have to come from within science. This however does not seem possible because scientists do not have the capacity or the interest to accept constraints – and they will insist on the ideology of freedom.

The scientific community belongs to society which still continues to support the sometimes huge amounts of money necessary for research. In this society everybody (lawyers, parents, police, friends) is accepting constraints, many of them self-regulated. This means that scientists too have to adopt self-regulation from within, even in „pure" science they should not allow themselves to inquire as they see fit. There have always been individual scientists who, based on their own ethical standards, refused to do certain research, but the scientific society as a whole does not try to conduct a dialogue, to discuss and negotiate the ethical aspects of their work with the whole society. Scientists as an elitist and exclusive group often insist that the larger society cannot understand them and pretend that a dialogue is impossible rightaway.

Ruedi Högger, Ph.D., Chairman of TIR

C.V. and Fields of Interest

Born in 1940, I studied history and – much later – analytical psychology. A large part of my career was in international development cooperation. I was Vice Director of the Swiss Government's International Cooperation Agency from 1981–88. Currently, I am the chairman of the Tibet Institute Rikon. Throughout the years, I have been engaged in research on the psychic background of development planning and projects. He have taught and written comprehensively on Buddhist and Hindu art and myths as well as Indian daily life rituals from the perspective of Analytical Psychology.

Main publications: Naga and Garuda: The Other Side of Development Cooperation, Sahayogi Press, Kathmandu 1993. The book analyses the problems of international development cooperation in terms of analytical psychology. In Search of Sustainable Livelihood Systems, coedited with Ruedi Baumgartner, Sage publications, New Delhi, 2004. Various articles in „Jungiana" as well as the Eranos Yearbook.

Abstract

The starting point of my lecture is the statue of a transcendental Buddha sitting on the coils of a Naga and being protected by the Naga's hood. My central question is: What is the psychological symbolism of the Naga in this context? In dialogue with Geshe Nyima Tashi, I then try to analyse and understand the meaning of the Naga in a stepwise procedure as usually applied in psychological analysis. The result – as I hope – will show the close relations between Buddhist Philosophy and Western Analytical Psychology.

Feedback (in German)

Als mögliche Ergänzung zum Kerngehalt des Projekts „Science meets Dharma" (SmD) betrachtet das Tibet-Institut Rikon die Durchführung von Workshops, in welchen sich buddhistische Gelehrte mit westlichen Wissenschaftern treffen und über bestimmte Themen austauschen. Im Unterschied zum Unterricht in den Klöstern soll ein solcher Austausch „auf gleicher Augenhöhe" stattfinden. Science und Dharma sollen sich auf einer neuen Ebene begegnen. Ein erster solcher „SmD-Dialog" wurde vom 7. bis 16. November 2011 in Bangalore durchgeführt, wo das „Dalai Lama Institute for Higher Education" den geeigneten Rahmen für eine solche Begegnung bietet. Finanziert wird diese Veranstaltung durch die Andrea von Braun Stiftung (D).

Als Beispiel für die Vielfältigkeit des Dialogs soll der Vortrag dienen, worin uns ein Geshe das buddhistische Konzept der Nagas erläuterte. Damit sind Mächte gemeint, die uns Menschen als Schlangen oder Drachen, manchmal aber auch als aussergewöhnliche Persönlichkeiten erscheinen. Buddhistische Mönche pflegen den Nagas nach ihrer Mahlzeit kleine Speisereste zu hinterlassen; die Nonnen von Jangchub Choeling verehren Nagas in Form von Schlangen. Berühmt ist die Legende von Nagarjuna, der in die Tiefen des Naga-Reiches hinabstieg, um dort Buddhas grösste Weisheiten in Empfang zu nehmen.

Tiefenpsychologisch lassen sich Nagas als seelische Kräfte verstehen, deren vielfältiges Wirken zwar erlebbar, dem rationalen Denken aber nicht zugänglich ist. Sie können in unseren Träumen ebenfalls in Gestalt von Schlangen auftauchen. Dasselbe gilt für Märchen aus den verschiedensten Kulturen, wo Schlangen oft als Helfer des Menschen erscheinen, sofern ihnen Beachtung geschenkt und Respekt erwiesen wird. Über eine solche Deutung der Nagas konnte unter den östlichen und westlichen Dialog-TeilnehmerInnen ohne grosse Schwierigkeiten Einigkeit erzielt werden.

Weniger einfach wurde es, als der Geshe ein Erlebnis aus seiner Jugend berichtete: Als 16-Jähriger weilte er in Nepal und litt unter starken Hautausschlägen. Davon erfuhr ein älterer Freund, der sich damals in Südindien aufhielt und dort eine Wahrsagerin nach dem Befinden des Knaben in Nepal befragte. Die Seherin erkannte das Leiden des Jungen sofort; ebenso erkannte sie, dass die Ursache der menschlichen Krankheit in der Krankheit eines Naga liegen müsse, der nahe der Behausung des Knaben wohnte. Sie empfahl ihm (via Brief des Freundes), Weihrauch zu verbrennen und „Schlangenmedizin" darzubringen. Nach wenigen Wochen war der Knabe genesen.

Niemand mochte dieser Erfahrung widersprechen, obwohl im Dialogkreis vorerst erhebliche Ratlosigkeit herrschte. Im Laufe der Tage schälte sich jedoch das folgende gemeinsame Verständnis heraus: Sowohl im Buddhismus als auch in der Tiefenpsychologie wird die menschliche Psyche („mind") als eine vielschichtige Wirklichkeit verstanden, die weit über unser Tagesbewusstsein hinausreicht. Während wir uns in diesem Tagesbewusstsein klar von anderen Lebewesen unterscheiden, sind wir in den Tiefen der Psyche mit anderen Wesen ver-

bunden. In dieser Tatsache wurzeln zahlreiche Phänomene unseres kollektiven Verhaltens sowie der Parapsychologie; auf ihr – so vermuteten wir nun gemeinsam – beruhte auch die Hellsicht der Wahrsagerin in Südindien. Sie „sah" die psychische Ursache der Hautkrankheit und gab ihr im Bild des Naga Ausdruck. Damit ermöglichte sie es dem Knaben, sich selber seiner Krankheit zuzuwenden und im Ritual Heilung zu finden. Physiker und NeurologInnen rätseln heute darüber, ob die Tiefenschichten der Psyche mit einem Quantenfeld verglichen oder sogar erklärt werden könnten. Unsere Diskussionen hierüber waren ausgedehnt, führten jedoch an kein Ziel. Zu vieles ist noch ungeklärt, wenn es um die Geheimnisse der menschlichen Seele geht.

Dana Rudinger, Ph.D., Zürich, Switzerland

C.V. and Fields of Interest

Dana Rudinger studied physics and did her PhD in neuroscience. She teaches mathematics and physics and, recently, „Theory of Knowledge" at secondary level and has been associated with SmD almost since its beginning. She also worked in Indonesia and Laos. She has been involved in activities concerning Tibet for many years.

Abstract

The presentation is based on an article by the physicist Vic Mansfield. Almost all laws of physics, especially collisions between particles, are symmetrical in time; nevertheless we experience a direction in time. In physics this asymmetry is described by the concept of entropy or „measure of lack of structure", whereas in Buddhism, according to Mansfield, it may reflect impermanence.

Feedback

First of all I would like to thank the organizers both of the Dialogue and of the Dalai Lama Institute for Higher Education hosting us for their hospitality and the good organization. The Dialogue was a wonderful experience both on an intellectual and emotional level.

I had hoped for an interesting, intellectually challenging encounter and soon found myself among friends: the participants may have differed in their views, sometimes quite fundamentally, but critical questions were accepted and the atmosphere in the group was respectful and even warm and welcoming. During tea breaks and meals, serious discussions alternated with relaxed chats and laughter. The personal account of successes and failures in Richard Ernst's autobiographical presentation was very touching.

Being, among other things, a teacher of Theory of Knowledge in the International Baccalaureate Programme, my main interest was to understand how Buddhism, or, more pre-

cisely, „Buddhist Science“ arrives at knowledge. The presentations and discussions offered an insight into the epistemology of Buddhism. I am not sure whether „Buddhist Science“ can be separated from the spiritual aspect, as both reasoning/logic and introspection in meditation contribute to knowledge. I am also doubtful whether „Buddhist Science“ fits into my wider understanding of science (Wissenschaft in German; but what defines science, anyway?) and whether I would consider meditation an experiment (but of course only some disciplines in classical science rely on experiments). What I am missing in „Buddhist Science“, this however may be due to a lack of knowledge, is an explicit statement of assumptions or axioms and an openness to consider major findings as preliminary. I did, however, understand that there is a clear methodology and that some findings are non-conceptual and thus cannot be put in words, or only approximately. This is an interesting aspect in the answer to the question whether knowledge is something purely conceptual or not. (I think it is not.) Actually, in my first Theory of Knowledge lesson after my return, I referred to the Dialogue four times!

I am still convinced that Buddhist methodology can contribute to knowledge about our inner selves, while I doubt that results obtained by introspection can be valid contributions to e.g. physics. Sundar Sarukkai voiced this view clearly. In his very stimulating talks he also made us aware of a possible cultural component inherent not only in doing science, but even in the approach to mathematics.

During the Dialogue I learned to value more the contribution of Buddhism, both Buddhist practice and aspects of Buddhist philosophy, to the wellbeing and development of humans and humankind. I have not changed my physicalistic view of the mind being a phenomenon brought forward by a physical entity (and not being separate from it), but I can see now a parallel between subtler levels of consciousness and the Western concept of the unconscious that is familiar to me. On a personal level I will try to apply techniques to be able to deal better with my emotions.

While preparing my own presentation about the arrow of time, I learned more about philosophical aspects of my own primary subject, physics. During my search, the connection between a law called the second law of thermodynamics (having to do with the fact that an egg breaks when it falls on the floor but a broken egg will not be observed to reassemble again) and the direction of time from past to present to future turned to be less agreed upon among physicists than I had anticipated. Some scientists even suggest that the direction of time is a matter of perception. I also learned that in the Buddhist view cause and effect can be both temporal (cause before effect) and non-temporal – as in „western“ applications of logic.

The session was truly interdisciplinary (I always enjoy that); as opposed to other interdisciplinary encounters I have experienced, this time eastern and occidental views had equal weight. Apart from the points mentioned above, I learned many facts, e.g. about research findings in neuroscience (especially about the eminent role of the prefrontal cortex!), about what I would call a model of the mind in Buddhism; about the use of modern molecular biology to demon-

strate the effectiveness of traditional Tibetan medicine, about Indian mathematics, methodology in analytical psychology, a cultural-historical approach to the history of art and science etc. The variety of backgrounds among the speakers was enriching. Once technical vocabulary (be it Buddhist or other) had been clarified to a certain extent, a stimulating exchange about contents, approaches and methodologies was possible.

Heiri Schenkel, M.Sc., M.Ed., Basel, Switzerland, Responsible for Dialogue 2011

C.V. and Fields of Interest

After learning the profession of designer in the industry, I studied experimental physics at the University of Zurich. After some industrial research I definitely turned to education and taught physics, mathematics and teaching methodology in Africa, Nepal, the US and, mostly, in Switzerland. After retirement my intercultural interest lead my as teacher to Sera monastery in Bylakuppe and to my engagement with SmD.

Abstracts

Part 1: My point of departure will be, as usual, optical interference at the double slit with its classical wave interpretation, using some demonstrations – as experimental physicists like to do. There will be the possibility, for those who wish, to assemble a spectroscope, which can be used to observe the light of different light sources. Following this a brief look at the history of science shows how the concept of quantum developed.

Part 2: Here I'll explain the conceptual difficulties science encounters when it has to explain how individual entities seen as waves or as particles can lead to interference and related phenomena. We'll see which interpretation seems to be accepted today and how the concept of entanglement has come in, which has led to an intense discussion of Buddhist concepts like interdependence and emptiness.

Feedback: Notes and impressions – Our place in splendid isolation

A peaceful campus with a spacious architecture, fields with high, wild grass bending in the wind when it becomes stronger in the afternoon, softly whistling between the houses. Young Tibetans, some of them beautifully dressed greeting you warmly and with a lot of respect, I nearly feel uncomfortable that they consider me an „eminent“ scholar. I would like to know more about their individual life stories and how they became so peaceful and soft in their manners and behaviour. This wonderful roof under which we take our meals, open to space. The same, uneasy feeling as before in Sera when I observe here too how Indian men and women do cleaning work and gardening for the Tibetans, although I know they are happy to at least have a job.

The importance of a Nobel Prize

Of course, if Richard Ernst would not have come, the whole week would have been very different and it would have lost a lot: Less vibrations of importance, less presence of the students, less highlights, may be also less humbleness. Richard avoided to coin important words or concepts and to present intricate logical deductions, he was just himself in a very humble way.

Logic and emotions in Buddhism

For my part I found it sometimes difficult to follow the logical deductions, classifications and to understand how Buddhist concepts come about, although they are always traced back to Buddha himself. Still I have great difficulties in not seeing human constructions behind Dharma systems (as behind any belief system) – while for scientific systems I accept their approximate, falsifiable and speculative constructions as such. Sometimes I have the impression that the „truths" taken as such by the Buddhists are put forward in a too absolute way and without a tint of emptiness. For me their legitimacy lies in their aim: To reduce suffering, to increase happiness – and this is effectively achieved, seems to me, in many places where the concept of compassion is lived.

Discussing with Buddhists

We had a very stimulating choice of Buddhist scholars. It was a pleasure and also humanly rewarding to discuss with them after the presentations and to sit together at lunch and dinner time. The numerical presence of Buddhist monastics and scholars was considerably smaller than that of the western part, although according to the schedule their numbers appear to be nearly equal. This was mainly due to the fact that some of the Buddhist participants were present only part of the time and left after their presentations, while the crew of around eight westerners was present all the time. This led to the impression that there was a numerical imbalance, as one observer spontaneously told me. The Buddhists who remained present all the time were very valuable and fully engaged discussion partners who helped considerably in having a long and fruitful discussion. I was astonished by the energy in the discussions. It could be observed that also students began to participate when the discussion became longer. So, to have ample discussion time was fruitful and encouraged participation.

The Indian highlight

We were in a Tibetan enclave, surrounded by an Indian reality which only creeps in with the soft Indian worker ladies and with the roaring noise of the four-lane highway (the one I saw as a rather narrow and quiet road six years ago, when not even one trace of construction of the campus was visible.) Sundar Sarukkai opened our eyes and our thoughts for this Indian culture, which, after all, was the birth-ground for Buddhism. For me his presentation was an eye-opener, although I already had read a bit about this in Needham and others. Sundar's input, I feel, will stimulate me to follow e.g. the accounts of Kerala's poetic trigonometric tables, or the rediscovery of Dharmakirti and Vasubhandu.

Again it hurt me deeply to hear about the ignorant destruction of Nalanda, the center of spiritual and philosophic curiosity of Hindu-Buddhism. It is said that the documents and buildings burned during six months, maybe they took longer to be consumed than those of Alexandria, some 800 years earlier. The ignorant, greed-driven burning of the pristine forests of the Chilean Andine forests took 150 years... According to Sarukkai the responsible curiosity of scientists must still be developed. Curiosity per se is not a responsible ethical attitude. This needs clarification: How can transforming the mind with introspective and other methods lead to an ethical attitude in scientific research (and its applications)?

Describing complexity with even more complexity

To have Armin, a young scientist and researcher among us was a special highlight. From his input about the history of mathematics, ending with recent developments, one got the feeling that a mathematical description of complex reality will be orders of magnitude more complex than reality itself: The books containing all the information and mathematical procedures to reconstruct the universe, or even only just the phenomenon of life, would take more space than the universe itself. The picture of the huge hall with all those aligned supercomputers serving to simulate (not even reconstruct) the brain of a cat gives an impression of the impossibility to describe complexity.

The „Danish/Swedish Light"

During the course I realized that we had a strong representation of one single institution, the Tarab Institute, among us. Especially Lene Handberg, the head person in this institute, made a strong impact on the discussions. The energy and the competence of the two Nordic scientists, Lene and Carin, helped to have prolonged and intense discussions. It was their merit that we had special sessions, partly in the evenings, with a form of interaction that was less formal than the plenary round table discussions. I remember well the evenings where we gathered to watch and discuss videos from the Oxford conference on Buddhism and Science until late in the night – this was intense and rewarding!

General personal remarks at the end of the course

Personally and in general I have a good feeling. I felt much dedication and willingness to engage in a serious and prolonged dialogue. The presentations were stimulating, so that the discussion time in the plenum was often used up to the last minute. For me it is certain that we entered into a serious dialogue and that we got closer to each other, not only personally, but also in understanding better the standpoints of the partner. As I said at the final ceremony, imposing the condition that the participants should be willing to question their own tradition of thought, to reflect it, can be seen as a sort of „colonial" attitude of the western side: If science is willing to question it's own paradigms this does not mean that we are entitled to ask the same from our monastic counterparts. For this purpose it would have been necessary to have more lay Buddhist scholars among us! That no nuns finally took part in the dialogue was also disappointing. Finally it was a great luck that our sponsor, the von Braun foundation, insisted on

having a small pilot course before engaging in a full-fledged Geshe course with a duration of four or more weeks! Such a big course would need a team of several persons for the preparation of the contents and teaching activities, and I'm happy we have been prevented from doing this! We would have been completely overwhelmed by the amount of preparatory work.

Outlook and Suggestions for Future Courses

• Not to envisage a „big" Geshe course of longer duration and more participants without having a team of 3 to 4 people for a careful preparation of the topics and materials to be included and the ways they would be presented.

• We should have a personal/material input which does not differ too much from what Science for Monks of Emory University is putting into its courses.

• The inputs of monastic and lay Buddhists must be framed well in advance. Aspects of meditation "techniques" should be included throughout the course and not only as a single, short event as in Bangalore.

• It should not be a closed Gelug happening, but again be open to other traditions and also other than just Tibetan Buddhists to open up a broader horizon. This could bring in some aspects of Buddhist Modernism. Future organizers must try harder to have also nuns and lay Buddhist scientists as participants in a future dialogue.

• Maybe we should have one more small SmD-Dialogue event, possibly in a different format, before embarking in a full-fledged Geshe course. We also could try out many different smaller formats for a dialogue, be it in India or in Switzerland, e.g. like the set of four lectures we gave at the Volkshochschule in Winterthur in March 2012 that found a vivid interest in the public. We also could try to organize a lecture/discussion event at the Collegium Helveticum in Zurich. The course in Bangalore gave us the occasion to get to know distinguished and open-minded monastic scholars – one or two of them could be invited to participate in such an event, together with monastics from the Tibet Institute in Rikon.

• Such a small course or event should concentrate on one specific topic, e.g. just consciousness, emptiness, dependent arising, etc. Apart from plenary discussions there should be more intense work and discussions in smaller groups, working towards a later publication of the findings.

• It finally took more time than expected to obtain and put together all the feedbacks of the participants of our dialogue event. The remarks and suggestions helped to have a fruitful discussion in Rikon in April 2012. They made clear to us that we still should look for other formats for events dealing with the dialogue between our two cultures. So it may be that a future „Science meets Dharma Dialogue (2013, 2014?)" will look somewhat different from the one we had together and will probably be held in Switzerland, possibly in Rikon – but definitely also with Buddhist and monastic participants coming from India.

Dhondup, Monastic of Bön Tradition, India

(edited) The Science meets Dharma Dialogue 2011 began under an auspicious signs and concluded in a very beneficial way of sharing thoughts and ideas between Buddhist and Western Scholars. During the whole sessions I learned a lot and this reminds me that I should use my Buddhist knowledge to learn more and use this knowledge in further research. Such a dialogue is needed even more in the future because through this kind of interaction we can learn more about our own system of thought and share it with others, and we can know more about each other's ideas and then take up the challenge of making the relationship stronger and the bridge between these two ways of thinking more stable or constant.

So I wish to state some viewpoints about the Science meets Dharma Dialogue 2011, which was held at the Dalai Lama Institute. Most of all the topics were interesting, so that there were ways to talk to each other, Western scientists and Eastern Buddhist scholars. (...) In this dialogue Western scholars listened or learned („learned" may not be the right way to put it) more about Buddhism, e. g. Buddhist epistemology, dependent origination, the theory of interdependence, the Buddhist perspective of Maya, some outlook of Bon religion as a native, original religion important in Tibetan culture and Buddha Shakyamuni's first sermon where he taught the Four Noble Truths.

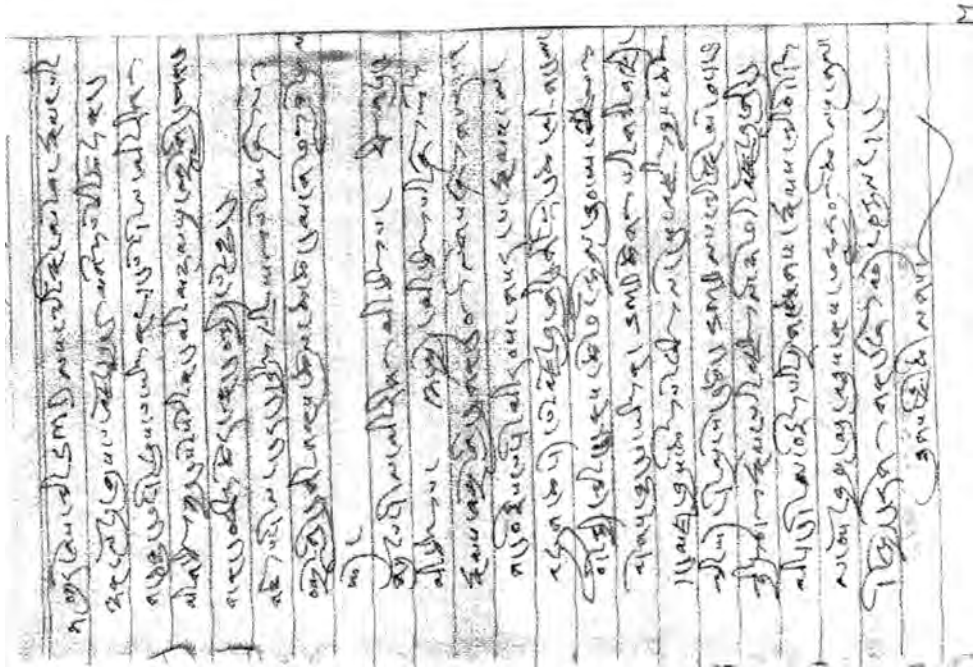
According to the Sakya school there are four types of avoiding attachment to become great practitioners. We Buddhists gained a lot of knowledge, especially from Nobel laureate Dr. Richard who told us through the story of his life that it is possible, if you are deeply interested, to study any subject and obtain results. This means that you should not discourage yourself (...), so you are your own master. Through his life we learned how to apply passion to make one's career meaningful. Lene who through the gratitude of Tarab Rinpoche's guidance and teachings got an incredibly profound knowledge of Buddhism shows us how Buddhism is available and beneficial to the whole world.

In summary I would like to say such a dialogue helps me personally and of course all of the Tibetan community as well as everywhere. One thing is that to hold the Dialogue here at the Dalai Lama Institute is very suitable and appreciated. So lastly I would like to thank all members of Science meets Dharma who enable us to pass wonderful days and I will be looking forward to get the chance to attend such a dialogue again and again in future.
Thank you.

Jamyang Gonpo, Monastic of Sakya Tradition, India

Feedback

I, Jamyang Gonpo, would like to share the following points with the respected members of the SMD.
Firstly even though we are from different cultural backgrounds, I felt happy to be one among the participants of the SMD dialogue.
Secondly, due to my poor English, I am sorry for not being able to follow the presentation thoroughly.
Thirdly the new knowledge and information exchanged during the dialogue among different people with different culture and different ideology be shared or transferred to the new generation of the world to help them exist peacefully in this complex modern world. If this is achieved, I would consider it as a success and glory of the project SMD.
Therefore, I would like to request the administration of the SMD to continue with their great work and make this world a place of peaceful existence for all sentient being.
Thank you.



Lobsang Gonpo, Monastic of Gelug Tradition, Mundgod, India: Feedback

Things I've learned

I feel very happy and honored to have participated in Science meets Dharma Dialogue. I have learned many things from it both in Buddhism and Science. So I don't even know where to start from. I've got very interested in Jung's Analytical Psychology, and Ruedi gave us a good overview of mental states and the notion of Psyche which quite well fits with the term Shepa (शेपा). And also analyzing the meanings of signs in dream, which has significance in Buddhist practice.

The lecture on Bön tradition: The history of Tibetan Buddhism is unimaginable without having knowledge of Bön tradition. We need to compare many aspects of Buddhist and Bön tradition.

I've found a good idea to explain topic of Pramanavartika "Shensel" or abstracting things based on negation. It's one of the main and the most impaitant topics of Pramanavartika. Further I'm looking for a way to explain in english the actual application of it to our daily practice.

I had a good opportunity to meet prof. Sundar Sarukai and listen to his lecture on Indian and Western philosophical schools. I've found it very important to study the developmental stages of ancient indian philosophy.

The theory of Entanglement was new to me. Neuroplasticity is one of the main topic I'll be studying in the future. The placebo effect: the activation of it, as I understood, is dependent on the persons mental attitude (perhaps trust in the doctor) Reminds me of the patients getting healed by healers.

Epigenetics is quite astonishing subject to me. I assume that it has connection with Karma theory, and I'll be working on to formulate my theory in future.

So in conclusion, I've found more bridges between Science and Dharma, more exciting topfields to study deeper, and what's the most important thing is that this dialogue will develope into application of knowledge and wisdom to our daily life.

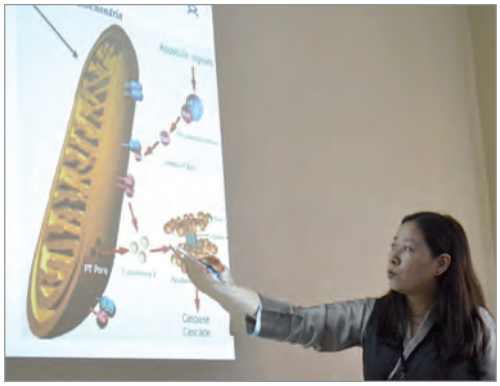
So I'd like to express my deepest gratitude to all the organizers and staffmembers who made this dialogue possible. I dedicate all my merits gained from this action for establishment of inner peace on Earth.

P.S.: I'm looking forward to participate in further SMD dialogues in future.

Some sketchy items

There were presentations and contributors we could not include in this collection because we didn't get any C.V.s, abstracts or presentations in written form. This may be because this format is a Western one and Buddhist contributors are not used to it and don't see the necessity to have these details included in written form. It is the physical presence and the spoken presentation which seem to be important.

Of course it would have been interesting to know more of the presentations of Tenzin Nyibum about The Tibetan Scientific Society (see also http://tibetanscientificsociety.com) and of a Tibetan lady scientist, Tenzin Choedon about Anti-Cancer Activities in Tibetan Medicine. And of others too.



We add just impressions to complete the „lost items“:

Beat von Scarpatetti, Ph.D., Historian

Some notes concerning elements of a relationship between Asian and European mystics (Written Contribution)

Eastern mysticism

The oldest Vedic texts of Brahmanism, the four Samhitas, speak about eternal wisdoms which are not revealed by any divinities (gods), but are pre-existent in the world and only can be perceived by prophetical seers. According to the oldest Samhitas, the Rig-Veda collection (16th–12th century before our era), the later Aranyakas introduced first pieces of advice for meditation in the solitude of the forests; in their final part, the Upanishads taught people to meditate in a quiet sitting attitude. The oldest Upanishads were put down before Buddhism arrived, and they had the vision of an All Embracing Unity containing the cosmos and the human world. Atman (breath) represents the principle of life, while Brahman finds immortality (as the supreme goal) already in the origin of the world. Thus the Karmic concept leads to the idea of Samsara, the metempsychosis (the transmigration of the soul), and hence the eternality of the soul. Later on, the vision of the All Embracing Unity was slowly transformed into a supreme divinity, a Supreme God. In later Brahmanism, the Upanishads were seen as a revolt against the dominating orthodoxy of the established priesthood in favour of free mystical thought. With the idea of rebirth a mystical way was opened into a profound knowledge of the cosmos, or even more, a path towards a complete fusion of the self with the All Embracing Unity, the Absolute. The reality of the world was considered the source of all suffering and the liberation from it was seen possible through the union of the soul with the divine Absolute. Beside all rites and magical practices, the mystics were convinced that only this inner way could lead to the Absolute, by this way also creating the doctrine of Ahimsa, the avoiding of harm to any living being.

Initiating Buddhism in the 6th century B.C.E., Siddharta Gautama – the Buddha – and the mystics revolted against the established orthodoxy and the domination by the Brahmin system. The enlightened Buddha aspired to reach, by overwhelming suffering, the state of Nirvana, thus again emphasizing the union of the soul with the All Embracing Absolute. This union did not require Samsara, although the concept of metempsychosis became finally firmly established. The method of mystic immersion consisted of a slow process of spiritual meditation which generates a new concept of Knowing/Knowledge. Existence, suffering and deliverance are explained without the concepts of God, Sin, Acquittal, Punishment, Grace. The Small Vehicle is marked by a rigorous a-personalism, the own Ego is considered too near to the world and too far from deliverance. The purification of the proper Ego can conduct in a long way via a terrestrial Dharma to Arhat, a state of perfection which can slowly transgress to Nirvana, without intervention of any gods. The Big Vessel recommends a less steep way by accepting the help of Bodhisattvas, and above all it does not strictly separate the transcendental sphere and the physical world. The enlightened persons represent a body of the Dharma that assures the link to the All Embracing Absolute as the only authentic reality.

Western mysticism

Western mysticism had its beginnings in late antiquity where some roots referred to the eastern Gnosis (cognition, secret knowledge) and also to the Neo-Platonists of the Hellenistic era. The increased mystical searching was paralleled by the rise of the scholastic schools since the 12th/13th century, which attempted to explain the religious revelations also by the way of rationality and to penetrate into the realm of metaphysics by a very sophisticated analysis of transcendental truth based on the method of Aristotle and his proceedings in logic and dialectics. So also „Meister Eckhart" (* ca. 1260, † 1328) was a learned teacher of scholastics in Paris, but also a spiritual prefect of several nunneries open also to laywomen who could receive their education there. He had to preach to them in German, that is, outside the Latin scholastic system. Doing this, he became the greatest and also most famous spiritual guide in the world of mysticism in Europe. For the time of Eckhart and for himself, the notion of „speculation" [speculatio] explains very well the aspirations of both metaphysical philosophy and mystical searching. Speculatio meant „view" or „viewing", and was a very delicate mixture of philosophy and meditation, a rational way and at the same time an inner meditative way. His masterworks are the Book of the divine consolation and the Book of the worthy human („Buch vom Edelen Menschen"), but the most distinct and outstanding work are his famous Sermons as preached to the nuns and laywomen, without being based on the learned Latin context of the university.

The aim of the search of Meister Eckhart and mystics like him was to find a Divine Essence and the union with it – this seems to be quite similar to the search of wise Asian thinkers. Meister Eckhart distinguishes himself in that he courageously went to the very bottom in the deepest speculations ever done in Western culture. Although in his mysticism he never left the proximity of scholastic philosophy, the authorities of the church inevitably accused him of expressing heretic views and he died during the ongoing investigation.

It is difficult to condensate Eckhart's mystical doctrines, or at least to give an idea of them and of his very practical suggestions for laypeople on how to ascend the spiritual steps. The best access in English might be The Mystical Thought of Meister Eckhart by BERNARD MCGINN (2009). Here are a few quotations attributed to the mystic:

I have said before that the shell must be broken through, and what is inside must come out. ... If you want to find nature [= essence] unveiled, all likeness must be broken through. ... When the soul finds the One, where all is One, there she will remain in the Single One. [DW 2.473, 5-9]. The Un-um, the One is the „grunt", the Ground. This Ground has no ground. The Ground is the uncreated something in the soul. The soul is a little spark („vunkelin"), an uncreated light, beyond the birth of the Word. God is becoming and not becoming, «got wirt und entwirt».

When I enter the ground, the bottom, the flood and the source of Godhead, no one asks me where I come from. ... There no one misses me, and there God unbecomes.

Then Eckhart asserts that the Ground of God and the soul's ground is one common Ground. It is a simple One, „ein einvaltiges Ein". For the limitless of the soul and this divine ground, Eckhart employs often the image of the desert, „die wuestunge". Through these very profound views, Eckhart has developed the so-called negative theology: all that we attribute to God is not God. The mystic has to learn to live, to know, to act from this Ground. Eckhart invites the sisters to „go in your ground and there act". On this setting is founded the secret of existence. Existence is unbegotten and neither begetting or begotten.

Leave place, leave time / Avoid even image
Go forth without way / On the narrow path
Then you will find the desert track.

Beat von Scarpatetti, October 29, 2011

A poem by Meister Eckhart
The Hope of Loving
What keeps us alive, what allows us to endure?
I think it is the hope of loving,
or being loved.

I heard a fable once about the sun going on a journey
to find its source, and how the moon wept
without her lover's
warm gaze.

We weep when light does not reach our hearts. We wither
like fields if someone close
does not rain their
kindness upon us.

Meister Eckhart also says:

Practice is better than precept;
but the practice and precept of eternal God is a counsel of perfection.
If I wanted a teacher of theology, I should go for one to Paris,
to its learned university.

However, if I came to ask about the perfect life,
why then he could not tell me.
Where then am I to turn?
To pure and abstract nature, nowhere else:
that can solve your anxious questions.
Why, good people, search among dead bones?

Why not seek the living part that is directly connected with creation and that gives eternal life? The dead neither give nor take.

Lobsang Nyima, Archeologist[2]

Scriptural Authority & Historical Research[3] (Written Contribution)

In the field of anthropology the question of what constitutes a religion has been subject to endless debate. Definitions aside, many world religions have developed similar characteristics even though their metaphysical beliefs may have little in common. Many religious traditions, for example, provide ethical principles and sets of practices that men and women tend to follow in order to attain a form of liberation or salvation. To support their endeavour they rely, in part, on written scriptures (e.g. the Buddhist Canon, Christian Bible, Hindu Veda, Jewish Torah, and Muslim Qur'an) which are typically believed to have been revealed by a founder figure. A body of people (e.g. Buddhist monks and nuns, Christian clergy, Hindu priests and pundits, Jewish rabbis, and Muslim imams) ordained for religious studies and well versed in rituals or other forms of religious observance frequently act as religious experts and in the long run become figures of authority. Ultimately written scriptures uphold religious orthodoxy and therefore remain unquestioned and unquestionable.

In the course of their history, religious communities contribute to the development of material culture by building places of worship (e.g. temple, sanctuary, and monastery), pro ducing images or symbols (e.g. statue, painting, and calligraphy), and by making cultic objects and religious implements (e.g. altars, incense burners, rosaries, and musical instruments). In addition to text-based information (e.g. scriptures, epigraphical inscriptions, and numismatic evidence), the materiality of world religions, rooted in the physical world, can consequently be an object of research for historical science. As we intend to discuss, the study of past civilizations and human development through their material remains ultimately sheds a unique light on the history of religious communities, practices, and beliefs that is at variance with scriptural tradition. This short paper aims to present a few examples of discrepancies between Buddhist literary tradition and modern historical research. For the purposes of clarity a few essentials ought to be borne in mind here.

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[2] *Lobsang Nyima is a Swiss archaeologist and Buddhist monk at Tashi Lhunpo Monastery, South India. He occasionally participates in Science meets Dharma projects where he teaches Ancient history, Buddhist archaeology, and Tibetan (pre-) history.*

[3] *This paper is a modest contribution to thank Heiri Schenkel for his kind invitation and for all the fruitful discussions we have had. I owe a debt of gratitude to Prof. Gregory Sharkey who patiently revised the English and gave wise counsel. Catherine Pittet and Thierry Theurillat made generous and insightful comments.*

Buddha, Buddhism & Buddhist Canons

Sometime between the 6th and 5th centuries BCE, a young prince named Siddhartha Gautama, also known as Sakyamuni, undertook a spiritual journey and eventually became the Buddha, or Enlightened One. Among historians, and the different Buddhist traditions of Asia, arguments continue regarding the date of Siddhartha's birth[4]. Following his enlightenment the Buddha started to preach the dharma[5] and gradually established an itinerant mendicant order or community known as the sangha. The Buddha and his disciples, both lay and ordained, did not live in monasteries (gompas) but would meet periodically in groves, villages or private households to recite the teachings and to discuss the rules of the order. Although the Buddha expounded the path to liberation for forty years or so, not a single word was written down during his lifetime. Buddhist tradition holds that at the age of eighty he passed away in a moment known as his final transcendence or parinirvana. The literary tradition has it that shortly afterwards a first council was held in order to recite and write down his word (i.e. the sutra, the vinaya, and possibly some parts of the abhidharma[6]).

When it comes to the process of preserving the Buddha's words and the material evidence of these texts, the earliest Buddhist manuscripts preserved belong to the Pali and Gandhari Canons, which were composed more or less at the same time between the end of the 1st century BCE and the 1st century CE, as palaeographical analysis and carbon-14 dating suggest. Not only were they written some four to six hundred years after the passing away of the Buddha and the first writing down of his word; but they also belong to different schools of Buddhism and do not necessarily reflect the same doctrinal influences[7]. Consequently, the original buddhavacana, the actual word of the Buddha, must, alas, remain uncertain.

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[4] See H. Bechert (ed.), When did the Buddha live? Controversy on the Dating of the Historical Buddha, Selected Papers Based on a Symposium Held Under Auspices of the Academy of Sciences (Bibliotheca Indo-Buddhica), Sri Satguru Publications, 1996.

[5] According to wikipedia, Dharma is to cultivate the knowledge and practice of laws and principles that hold together the fabric of reality, natural phenomena and personality of human beings in dynamic interdependence and harmony.

[6] In Buddhism, the sutra refers mostly to canonical scriptures, many of which are regarded as records of the oral teachings of Gautama Buddha. The vinaya is a Buddhist scripture concerning the monastic rules (e.g. for discipline) for monks and nuns. „Abhi" means „higher, special or above", thus making Abhidharma the „higher teachings" or even the „metateachings". In the West, the Abhidharma has generally been considered the core of what is referred to as "Buddhist Psychology" or even as a sort of Buddhist natural science.

[7] The compilation of Pali Canon is attributed to the Sthaviravada-Theravada school while the Gandhari Canon belongs to the Dharmaguptaka. They are two of the three surviving vinaya lineages.

After the 1st century CE, Buddhism broke out of its cultural, linguistic, and geographic cradle in the Ganges plain and spread throughout the Indian subcontinent, Central Asia and Southeast Asia as a result of which the Buddhist scriptures were translated into several non-Indic languages (e.g. Chinese, Tibetan, and Korean). In the compiling of these new canons great effort was expended in the translation of Buddhist terminology. Their comparative analysis occasionally reflects doctrinal innovations, regional trends, or cultural influences.

The diffusion throughout Asia of various traditions (i.e. yana), doctrinal affiliations (e.g. gradualism, yogacara), or schools (e.g. sthaviravadin and Tibetan sects) which over time compiled their own corpus of texts and exegetic literature, was accompanied by an artistic flowering based to a greater or lesser degree on the written sources. Stupa monuments (chorten), cave sanctuaries, and viharas (Buddhist monasteries) came to be richly decorated with paintings and sculptures depicting visual narratives of the lives of the Buddha, or devotional and tantric imagery, etc. The evolution of Buddhist art equally reflects the complexity of this tradition and the multiplicity of forms – both scriptural and devotional – that Buddhism developed over time .

Today more than ever before, Buddhism is multifaceted and plural. Migrations of Asian communities (e.g. Japanese, Vietnamese, and Tibetan), communication technologies and mass media have contributed to the diffusion of Buddhism worldwide. Canonical literature has been translated into many Western languages[9] and Buddhism's encounter with the West is giving birth to a new cultural expression of this tradition. Nonetheless, institutionalised Buddhist communities, lay and monastic, seem to preserve a rather traditional, or even conservative, approach to contemporary issues. Their insistence on relying on scriptural evidence and canonical literature alone is challenged in more than one field, as the following examples indicate.

Monasticism & Monasteries in Ancient India
Canonical Literature & Archaeological Vestiges

For 19th and early 20th century scholars, the history of Indian Buddhist monasticism was unquestioningly based on the view that texts such as the Vinaya Pitaka (the vinaya basket) reflects, not only the deontological code (the normative ethical rules) of early Buddhist communities, but the actual daily life of monasteries in ancient India. This same perception is still

[8] *See D. Patry Leidy, The Art of Buddhism; An Introduction to its History and Meaning, Shambhala Publications, 2008.*

[9] *Contrary to what some Buddhist monastics believe, European languages (e.g. English, French, and German) are perfectly apt to render Buddhist concepts or coin neologisms thanks to a rich etymological background and a shared Indo-European heritage. Moreover, not only have western academics a long tradition of philosophical and philological studies but they were also the first to decipher and translate many ancient Asian languages (e.g. Kharosthi).*

largely prevalent in almost all contemporary Buddhist traditions; and the vast content of the vinaya is believed to go back to the Buddha himself.

As briefly noted earlier, the development of different vinaya corpuses and their redactions happened over many centuries. Three of these are still in use today, the Theravadin vinaya (in Burma, Cambodia, Laos, Sri Lanka, and Thailand), the Dharmaguptaka (in China, Korea, and Vietnam), and the Mulasarvastivada (in Tibet and Mongolia). The last of these was composed in Sanskrit between the 5th and 6th centuries and translated into Tibetan between the 9th and 10th centuries (i.e. into the Lower Tibet Vinaya and then the Upper Tibet Vinaya). In the Derge edition, the Tibetan Mulasarvastivada vinaya is almost four thousand folios, takes up thirteen volumes, and constitutes one of the five major subjects studied by the Gelugpa candidates for the prestigious title of Geshe.

Yet, with regard to Indian Buddhist monasticism, vinaya sources describe fully developed, well-organised, walled monasteries that archaeological records and epigraphical inscriptions do not attest for the pre-Ashoka period (i.e. before the middle of the 3rd century BCE). The earliest Buddhist sites in India attested by archaeological findings are not even monasteries but rock-cut architectural caves containing stupa monuments and worship halls or shrines known as chaitya-griha most of which are found on the western Deccan plateau in the Indian State of Maharashtra, and which chronologically cannot be much older than 250 BCE (e.g. Karla, Bhaja, and Bedse)[10].

By the 2nd century BCE, monastic complexes or viharas developed along trade routes and at economic centres (e.g. Thotlakonda in Andhra Pradesh and Takshashila in Pakistan). These monasteries gradually adopted a standard plan which consists of a walled quadrangular courtyard flanked by monastic cells. They could also host chaitya shrines and monumental stupas, as at Sanchi in Madhya Pradesh, which were the focus of devotional practices (i.e. circumambulation and offerings). In addition, facilities such as water tanks, storerooms, kitchens, refectories, and bathrooms were also built within monastic complexes. These elements appear to be in perfect contradiction to the literary description of the early Buddhist community as an itinerant order composed of wandering monks and nuns who would go and beg their daily food as described in other scriptures. How could the Buddha and the first sangha have then been responsible for the composition of vinaya sources in which the construction and use of steam rooms (jentaka) were scrupulously elaborated?

Although these examples may sound trivial, historical studies based on comparative analysis and material evidence provide a more realistic picture of the life of Buddhist communities in

[10] See R. Coningham, „The archaeology of Buddhism", in Archaeology and World Religion, edited by Timothy Insoll, Routledge, London, 2001, pp.61-95. And also G. L. Barnes, „An Introduction to Buddhist Archaeology", in World Archaeology, Vol.27, No.2, Oct.1995, pp. 165-182.

ancient India. They challenge traditional assumptions based on canonical literature. Largely ignored by monastic communities, the work of historians and archaeologists invites reflection, or as Schopen puts it, „the early history of Buddhist monasticism and Buddhist monasteries in India must be fundamentally rethought and re-examined“[11].

Monasteries in the Western Himalayas
Hagiographic Literature as Historical Source

Around the beginning of the 10th century CE, West Tibet was the theatre of a Buddhist renaissance known in Tibetan literature as the „later diffusion“. This massive cultural and intellectual process was initiated by a dynasty of pious kings and furthered by the work of Buddhist scholars, among whom was the famous Tibetan translator Rinchen Zangpo (958 – 1055).

The latter was sent to Kashmir and Bengal where he spent many years in order to learn Sanskrit and to study and translate over one hundred and seventy-eight Buddhist texts, many of which still bear his name in their colophons. The name of the translator thus became strongly associated with the gsar ma movement, which designates a second wave of translation and the formation of new Buddhist schools.

According to the translator's hagiographies, Rinchen Zangpo is also credited with the founding of a hundred and eight religious edifices, such as temples (lha khang) and stupas, which are disseminated all over Upper Kinnaur, Spiti, Ladakh, and Guge. Generally speaking, hagiographic literature is regarded suspiciously in the field of historical studies due to its tendency to narrate extraordinary and supernatural events[12]. While Tibetan spiritual biographies (rnam thar) may somehow provide valuable information for the understanding of Tibetan history, their content calls for corroboration from other sources. Likewise the number hundred and eight must be understood symbolically as an auspicious number which may not reflect the reality behind Rinchen Zangpo's patronage.

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[11] For his outstanding contribution to the history of Indian Buddhist monasticism, see the following titles: G. Schopen, Bones, stones, and Buddhist monks: collected papers on the archaeology, epigraphy, and texts of monastic Buddhism in India, University of Hawaii Press, 1997. Buddhist monks and business matters: still more papers on monastic Buddhism in India, University of Hawaii Press, 2004. Figments and fragments of Mahayana Buddhism in India: more collected papers, University of Hawaii Press, 2005.

[12] Tibetan historian and Canada Research Chair in Religion and Contemporary Society in Asia at British Columbia University, Tsering Shakya, suspects a reluctant and disinclined feeling among contemporary Tibetan monastics to produce rnam thar after the passing away of important religious figures (e.g. 16th Karmapa). See T. Shakya, Tibet: Does history matter?, UC Berkeley, 2006, http://www.youtube.com/watch?v=uA6jlvwrtns.

Regardless of archaeological evidence, such as architectural typology, wall-painting style, and epigraphic inscriptions, people in the Western Himalayas continue to credit him with the founding of many „magical temples" built overnight, or self-manifested (e.g. Ribba, Thangi, Nako, and Tabo). The famous monastery and translation centre of Tabo[13] in the Spiti valley is a classic example of this. It comprises nine different buildings revolving around the main temple, a three dimensional architectural representation of Sarvavid Vairocana's mandala, also known as the vajradhatu mandala. This powerful aesthetic and architectural work, with its thirty-six life-size clay statues projecting from the walls, is based on the Compendium of Principles of All Tathagathas[14], an Indian Buddhist tantra translated by Rinchen Zangpo.

Despite the significant role played by the great translator in revitalizing Buddhism in this area, Rinchen Zangpo cannot be the founder of the main temple at Tabo as is claimed by later Tibetan tradition. The argument against such claim is threefold. First and foremost, an inscription located on a wall of the sanctum unambiguously states that the building was renovated by the royal priest Byang chub'od forty-six years after his grand-uncle king Yeshes'od founded it in 996. Above the so-called „Renovation Inscription", a wall-painting also represents Byang chub'od surrounded by the lay and monastic community of that time. At his feet stands a richly dressed person from Rum who has been interpreted as the main donor. Not only does the Restoration Inscription not mention the name of Rinchen Zangpo, but another wall-painting located inside the entry hall, which clearly belongs to the first construction phase, depicts the first monastic community of Tabo. Each monk is represented individually and his name is recorded in a small cartouche just below. The famous translator and supposedly founder of Tabo Monastery is not one of them. Finally, based on philological research, some historians have conclusively argued that Rinchen Zangpo was in all likelihood sojourning in Kashmir in search of more Buddhist texts in the year 966. Despite this clear evidence he is still credited with the construction of the temple and his hagiographies largely prevail as sources of historical information.

Scriptural Authority & Western Epistemology

In the light of the preceding discussion, it is probably fair to note that historical studies are not always conducted according to solid methodological principles and can be overly confident in

[13] The scientific literature about Tabo is too vast to be mentioned here. See D. E. Klimburg-Salter, Tabo, a Lamp for the Kingdom: Early Indo-Tibetan Buddhist Art in the Western Himalaya, Milan, 1997, Tabo Monastery: Art and History with an Interview of Geshe Sonam Wangdu by Peter Stefan, Vienna, 2005.

[14] The Buddha is quoted on numerous occasions in the Pali Canon as referring to himself as the Tathagata instead of using the pronouns me, I or myself. This may be meant to emphasize by implication that the teaching is uttered by one who has transcended the human condition, one beyond the otherwise endless cycle of rebirth and death, i.e. beyond suffering.

their conclusions. Occasionally, historical studies become political and justify some national or territorial claims based on pseudo-scientific literature. In its worst instances, the study of the past serves as ideological propaganda.

In the perspective of this new Science meets Dharma course, we wish to underline the absolute necessity for both parties to engage in an unbiased and critical analysis of their respective disciplines.

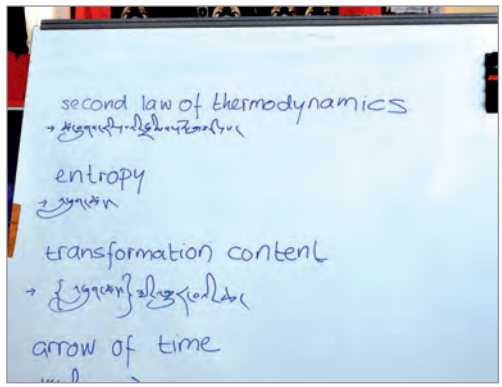
Due to the long history of political movements, intellectual reforms, and scientific discoveries in the West, knowledge itself (i.e. use of language) has come under criticism for its tendency toward authoritarianism and coalescence with power. A branch of western philosophy (i.e. epistemology) hence started to address the questions of the nature and development of knowledge, as well as the means of its production.

In the field of historical science too the study of the way history has been and is written came to be the focus of historiography, which aims at underlining the changing interpretations of past events in the works of historians.

With regard to the history and development of Buddhist thought, art, and practices, however, these questions are often left to secular academics. A dispassionate, self-critical, and diachronic analysis of Buddhism does not seem to interest traditional monastic communities for whom the Buddha's omniscience and the content of canonical literature are incontrovertible facts. Ultimately, this singular insistence on scriptural authority[15] shows not only the constraints of Buddhist ἐπιστήμη (i.e. scientific knowledge, epistemology) but also the limits to an open dialogue with contemporary western thought. The question whether there is a common platform of discussion between Buddhism and modern science is long overdue. Actors from both sides have been dialoguing for more than three decades now. These individuals, however, often represent a minority among their peers for their willingness to engage into unfamiliar grounds but also for their capacity to view their own tradition critically. The debate, however, gets muddy when one party is engrossed with certitudes. The conservative attitude, which still prevails in some Asian monastic communities, noticeably points towards the altered form of a soteriological tradition within which the authority of the clergy and thus its power and influence are at stake.

September 29, 2011

[15] *In Buddhist philosophy inference based on scriptural evidence is regarded as a prime cognizer but only of the second class (inferential cognizer). In modes of reasoning or pramana, priority is given to a direct perceiver which is defined as a new, non-deceiving and non-mistaken knower that is free from conceptuality.*


second law of thermodynamics
entropy
transformation content
arrow of time

Feuernde Neuronen und platzende Blasen

Science meets Dharma Dialogue 2011

Autor: *Dr. Alexis Dworsky* / Projekt: *Feuernde Neuronen und platzende Blasen – Science meets Dharma Dialogue 2011* / Art des Projektes: *Tagungsbericht zum Geshe-Kurs, 07.–16. November 2011, in Bangalore/Indien*

Was haben tibetische Mönche und westliche Naturwissenschaftler einander zu sagen? Können sie überhaupt miteinander reden oder gar voneinander lernen? Ein zweiwöchiges Treffen in Indien sollte das ausloten. Dabei stießen eine Handvoll buddhistischer Mönche und Gelehrter, die dort im Exil leben, auf ebenso viele aus Europa angereiste Forscher, unter ihnen der Chemienobelpreisträger Richard R. Ernst. Und mittendrin ich – Künstler, weder Mönch noch Naturwissenschaftler.

Tibetische Inseln auf dem indischen Subkontinent: Etliche tausend Flüchtlinge aus Tibet, Mönche wie Nonnen, aber auch ganz gewöhnliche Menschen, leben in den Klöstern und Siedlungen im Süden Indiens. Was sie aus den verschneiten Tälern des Himalayas in diese tropischen Gefilde geführt hat, ist nicht der Wunsch nach materiellem Wohlstand, sondern der Drang nach religiöser Freiheit, nach Selbstbestimmung in ihrer Bildung. Denn nur außerhalb des von China besetzten Tibets ist es ihnen möglich, ihrem Glauben und einer hohen buddhistischen Ausbildung uneingeschränkt nachzukommen.

Einen ersten Einblick, wie ungewohnt das spirituelle Schaffen der Tibeter erscheint, erhielt ich im Kloster Sera Jey. Hier versammeln sich jeden Abend hunderte Mönche im Hof. Während einige einzeln am Boden sitzen, stehen die anderen vor ihnen und schreien eigenartig rhythmisch auf sie ein. Besonders seltsam ist, dass sie dabei auf die sitzenden Männer einzuschlagen scheinen. Doch was wie ein Volltreffer klingt, entpuppt sich nur als Klatschen in die eigenen Hände. Und unmittelbar vor dem Kopf des Gegners wird der vermeintliche Schlag stets abgebremst. Zwar nicht ihren fremdartigen, doch ihren aggressiven Eindruck verliert die Szenerie rasch. So konnte ich immer wieder sehen, dass die Mönche lachen, einander umarmen und necken. Das Geschehen ist eine Übung in philosophischer Debattierkunst, ein wesentlicher Teil der Mönchsausbildung.

Wie mag die Diskussion zwischen westlichen Naturwissenschaftlern und tibetischen Mönchen wohl ablaufen? Ich habe mir einen zerstreuten Forscher mit strubbeligen Haaren, weißem Laborkittel und erhobenem Zeigefinger vorgestellt, den ein kahl rasierter Mönch mit scharlachroter Robe sozusagen abklatscht. Ort des Treffens zwischen den Wissenschaftlern und Mönchen war das *Dalai Lama Institute of Higher Education* am Rande der Millionenstadt Bangalore, einige Busstunden von den tibetischen Klöstern und Siedlungen entfernt. Als erster Redner wurde Gesche Nyima Tashi angekündigt, niemand Geringerer als der philosophische Leiter des von mir besuchten Klosters.

Doch es kam ganz anders als erwartet. Geshe Nyima Tashi schaltete sein Handy aus, steckte einen USB-Stick in den Laptop und startete eine Power-Point-Präsentation. Rein formal war sein Vortrag nicht von dem an einer westlichen Universität zu unterscheiden. Abgesehen von einem buddhistischen Altar im Hintergrund glich auch das Umfeld dem einer Tagung wie man sie bei uns kennt. Wir saßen nicht im Schneidersitz auf dem Boden, sondern auf den üblichen Klappstühlen an gewöhnlichen, zu einem großen Halbkreis zusammengescho-

benen Tischen; vor jedem Teilnehmer stand ein Namensschild, ein Trinkglas und eine kleine Plastikflasche mit Mineralwasser. Und ja, wir alle konnten ganz unkompliziert miteinander reden: Sämtliche Teilnehmer sprachen Englisch. Ich war fast ein wenig enttäuscht.

Im Dialog: Richard R. Ernst und Geshe Nyima Tashi

Mehr als entschädigt wurde mein Verlangen nach Exotik allerdings durch die Inhalte der Vorträge, und zwar nicht nur von denen der Tibeter. So erfuhr ich zum Beispiel einiges über Naga, eine Schlangengottheit, die aus buddhistischer Sicht ebenso eine Tatsache ist wie die Reinkarnation; ich wurde aber auch über ein Verfahren namens *Nuclear Magnetic Resonance Zeugmatography* informiert, darüber wie sich mit Hilfe radioaktiver Strahlen und einem Computer Bilder aus dem Inneren des menschlichen Körpers erzeugen lassen.

Immer wieder wurde über die Unterschiede, aber auch über die Gemeinsamkeiten von Buddhismus und Naturwissenschaft gesprochen. Wissenschaftler wollen etwas über die Welt erfahren, sie wollen, beinahe wörtlich genommen, Wissen schaffen. Die Buddhisten möchten zwar auch etwas über die Welt herausfinden, vor allem aber wollen sie das Leid in ihr mindern. Mittels Technik will das die Wissenschaft auch: Forschung erfülle keinen reinen Selbstzweck, sondern soll letzten Endes hilfreiche Dinge hervorbringen, etwa Atomreaktoren, Antibiotika und Nylonstrümpfe. Den Buddhisten geht es aber weniger um das materielle Leid als vielmehr um das geistige – wahres Glück komme nämlich von innen. Wissenschaft und Buddhismus seien sich ähnlich, weil beide die eigene Erfahrung über die Aussagen jedweder Autoritäten stellen: „Einstein hat gesagt…“ gilt angeblich bei den Natur-

wissenschaftlern genauso wenig wie „Buddha hat gesagt…“ bei den tibetischen Mönchen. Und doch wurde stets auf wissenschaftliche wie buddhistische Größen verwiesen. Buddha selbst habe angeführt, dass man mit seinen Worten ebenso verfahren solle wie ein Goldschmied mit einem Klumpen des vermeintlichen Edelmetalls: Man soll skeptisch sein, sie auf die Waagschale legen und allen nur erdenklichen Tests unterziehen. Bestehen sie die Prüfung nicht, sind sie abzulehnen.

Doch sehr verblüffend fand ich, dass tibetische Mönche und westliche Forscher bei fundamental unterschiedlichen Vorgehensweisen angeblich zu gleichen Erkenntnissen gelangten. So wurde etwa behauptet, dass die Buddhisten auf Grundlage ihrer meditativen Erfahrung bestens über die Quantentheorie unterrichtet wären. Und das nicht erst seit dem zwanzigsten Jahrhundert: Bereits in den Texten, die vor fast zweitausend Jahren vom großen buddhistischen Philosophen Nagarjuna verfasst wurden, fänden sich entsprechende Hinweise. Wie ist das möglich? Die Vorträge und die daran anschließenden Diskussionen gaben darüber kaum Auskunft. Doch am Rande des offiziellen Programms, beim gemeinsamen Essen und Teetrinken sowie beim geselligen Miteinander am Abend fanden sich genug Möglichkeiten, diesen Fragen nachzugehen.

Im tibetischen Buddhismus wird, soweit ich das verstanden habe, zwischen einer konventionellen und einer ultimativen Wahrheit unterschieden. Erstere hat mit unserem alltäglichen Leben zu tun. Mittels Vereinbarung sind die Dinge klar benannt und voneinander abgrenzbar. Die Meditation würde es einem jedoch ermöglichen, zu einer tieferen, wahrhaftigen Wirklichkeit vorzustoßen. Und in dieser offenbaren sich wesentliche Grundsätze des Buddhismus: das Prinzip der Leere, das des steten Wandels und das der wechselseitigen Abhängigkeit. Die Dinge und Begriffe an sich sind nur Konstrukt, weil jedwedes Dasein in ständigem Fluss ist und mit allem in Verbindung steht. Auch unser Geist ist demnach nichts Abgegrenztes; auch er befindet sich mit dem ganzen Universum in Austausch. Und so sei es möglich, alleine durch unser Bewusstsein, mittels Meditation, über Mikro- wie Makrokosmos Erkenntnis zu erlangen.

Elektronenmikroskope, Radioteleskope und Teilchenbeschleuniger sind für dieses Wissen nicht erforderlich; man muss nur mit verschränkten Beinen stillsitzen und tief in sich gehen. Doch ganz so einfach ist das natürlich nicht. Denn hier kommt wiederum die eigene Erfahrung ins Spiel: Jeder muss das, was er wissen will, selbst herausfinden und gewissermaßen zu seiner eigenen ultimativen Wahrheit vorstoßen. Wenn seitens der tibetischen Mönche und der westlichen Teilnehmer, die bereits weitreichende Kenntnisse vom Buddhismus hatten, Begriffe wie Quantenfeld verwendet werden, sollte man also Vorsicht walten lassen. Womöglich ist es im Buddhismus so wie in der postmodernen Philosophie: Solche Formulierungen sind meist Begriffsklauberei und haben vorwiegend literarischen Wert.

Weiterführender ist da wohl der Dialog über jenen Sachverhalt, über den die Mönche herausragende Erfahrung besitzen, nämlich die Beschäftigung mit dem menschlichen Bewusstsein. Auch von westlicher Seite waren hierzu Experten eingeladen, etwa Carin Muhr, eine schwedische Gehirnforscherin, und Armin Duff, ein Schweizer Neuroinformatiker. Auch innerhalb der Naturwissenschaft gibt es also unterschiedliche Ansätze, zu erforschen, was unser Denken ausmacht. Den verschiedenen Positionen ist allerdings eines gemeinsam, der Blickwinkel: Man schaut von außen auf das menschliche Ich, nimmt die Perspektive eines externen Beobachters ein. Und so wird das Denken als bloßer elektrochemischer Vorgang gesehen, der sich quantifizieren lässt, der messbar ist; unsere Gedanken werden als Aktivitäten im Gehirn verstanden, die sich als elektrische Ströme erfassen lassen. Immer wieder tauchte dabei der Ausdruck „feuernde Neuronen“ auf. Farbenprächtige, computergenerierte Bilder wurden präsentiert, die miteinander verflochtene Gehirnzellen zeigen, die aussehen wie Tintenfische, durch die Blitze zucken.

Verschiedene Beobachtungsperspektiven: Der Bön-Mönch Dhondup Gyaltsen meditiert mit einem Elektroenzephalograph auf dem Kopf.

Ganz anders der Blickwinkel der tibetischen Mönche: Ihr Forschungsgegenstand ist das eigene Denken; sie erkunden ihr Ich selbst, blicken sozusagen von innen darauf, aus der eigenen Perspektive. Die Methode der Buddhisten würden wir als Introspektion oder eben als Meditation bezeichnen. Zwar hat uns Khangser Rinpoche, die Wiedergeburt eines bedeutenden Lamas, praktisch gezeigt wie man meditiert, doch wie man auf diese Weise sein eige-

nes Bewusstsein zielführend untersucht, blieb mir verborgen. Verwundern darf das allerdings nicht, wenn man bedenkt, dass sich die Ausbildung eines Mönches über mehrere Jahrzehnte erstreckt und ein sogenannter Geshe-Abschluss – er ließe sich als Doktor der Göttlichkeit übersetzen – in der Regel zwanzig Jahre beansprucht und die Mönche während dieser langen Zeit täglich viele Stunden meditieren müssen. Obgleich ich von buddhistischer Seite keine farbenprächtige Computeranimation unseres Denkens zu sehen bekam, gibt es auch hier ein einprägsames Bild: Der Geist sei ein Ozean, auf dem die einzelnen Gedanken wie Blasen auftreffen und sogleich platzen.

Es wäre eine mehr als absurde Vorstellung, wenn tibetische Geistliche mit Elektroenzephalographen auf dem Kopf in den Klöstern von ihren Mitmönchen gescannt würden. Ebenso unsinnig wäre es, von einem westlichen Forscher zu verlangen, dass er den Großteil seiner Tätigkeit damit verbringen solle, in seinem Labor zu meditieren. Voneinander lernen darf nicht heißen, dass man die Methoden und Erkenntnisse der Gegenseite blind übernimmt oder gar von seinem „Glauben“ zu deren konvertiert. Voneinander lernen sollte eher bedeuten, dass man Erkenntnisse sinnvoll verschränkt und Wege kombiniert. Das freilich klingt sehr modisch und abstrakt. In Bezug auf ein umfassendes, ganzheitliches Wissen des menschlichen Bewusstseins erscheint es mir aber alles andere als abwegig, dass tibetische Mönche und westliche Wissenschaftler vieles voneinander lernen können. Ob man auf buddhistischer Seite bereit ist, Erfahrungen anderer mit denen der eigenen Person als ebenbürtig anzuerkennen, ist fraglich. Auch ist schwer zu sagen, ob man seitens der westlichen Wissenschaft gewillt ist, subjektive Erfahrungen gleichberechtigt neben objektive Erkenntnisse zu stellen.

Doch eines scheint klar zu sein: Damit es soweit kommen kann, muss miteinander gesprochen werden. Mit dem Treffen in Indien ist ein erster Schritt getan. Wir dürfen also gespannt sein, ob und wie sich der Dialog entwickelt!

The Learning on the Ground project took place between May 2011 and January 2012 in São Paulo, Brazil and applied interdisciplinary and transdisciplinary working methods toward expanded access to creative arts education for disadvantaged youth from the Bamburral and Arvore São Tomas favelas. The project cultivated a practice of learning based on the values of service, proximity, and experimentation, reframing education for children from favelas in four ways: First, it identified the two favelas as active spaces for learning and as resilient urban neighborhoods, thus debunking conventional notions of favelas as unproductive. Second, through exercises with films and photography, children became storytellers and thus „teachers" of their own communities. Third, through occupying unused spaces in the favela, the project transformed these areas into a network of small community centers. Fourth, by involving local children and adults plus architecture students from the Escola da Cidade, and publicly presenting their work, the project united participants who might not otherwise work together. It dismantled conventional boundaries between education and housing and crafted creative conduits between the favelas and the city at large.[1]

The primary lesson derived from the Learning on the Ground project is that educational opportunities for children who live in favelas can be improved through the co-creation of knowledge between communities, interdisciplinary practitioners, and local government, specifically the Secretary of Housing (SEHAB). As a result, SEHAB regularly interacts with favela residents through housing urbanization projects.

[1] *The Bamburral favela is one of thousands of informal settlements that occupy approximately 30% of Silo Paulo's urban fabric.*

Learning on the Ground: Co-Created Knowledge from the Bamburral and Arvore São Tomas favelas in São Paulo, Brazil

Autorin: *Kristine Stiphany* / Projekt: *Learning on the Ground: Co-Created Knowledge from the Bamburral and Arvore São Tomas favelas in São Paulo, Brazil* / Art des Projektes: *Forschungsprojekt im Rahmen der Dissertation*

Translations

„Olha! Ha uma cachoiera na comunidade so para nos!"
Look! There's a waterfall in the community just for us!
-Larissa, participant of the Learning on the Ground project

It is a fall day and 14 children are running on a dirt path bound by simple wood and brick facades. The illuminated facades are punctuated by a series of slight openings, each giving way to sinuous staircases that stitch together the self-built structures of the Bamburral favela.[2] Sharing a camera in pairs, children hold hands and dart in and out of the openings freely, locating patterns, turning the lens on themselves, or interviewing their peers. Unabated laughter and a cadence of footsteps echo throughout the community. The children are stealthily, transforming the most treacherous of situations into opportunities. Here, even the remnants of a deadly mudslide become a magical waterfall within days. These are the children of the Coletivo de Arte do Bamburral (the Bamburral Art Collective) and over the course of four years they have constructed a practice of learning from the ground up of a Brazilian favela.

The Coletivo de Arte do Bamburral was founded in 2008 as an art workshop for children in the Bamburral favela. Weekly Saturday classes on a community veranda and outings to other parts of the city charged 15 participants with representing their lives in relationship to the spatial realities of their community and the city of São Paulo. The work produced from the two years of the Coletivo illustrates how children transform challenging contexts into opportunities with meager means and an abundance of will. As Pele, the father of three participants, relayed at the São Paulo Calling conference, „The Coletivo changed the lives of my children and as a result it changed my life."[3] However, while the activities of the Coletivo began to challenge boundaries within the consciousness of the young participants and within the favela, it fell short of striking sustainable ties outside of the favela.

The Learning on the Ground project, funded by the Andrea von Braun Foundation, filled this gap. Implemented between May 2011 and January 2012, the Learning on the Ground project had two primary objectives: to continue the Saturday drawing class and city outings and to use new technologies of GIS (Geographic Information Systems), photography, and film to generate a series of maps that would supplement digital maps produced and used by the City of São Paulo Housing Authority (SE HAB). This learning paper explores how the values of service, proximity, and experimentation shaped the Learning on the Ground

[2] *While Favela refers to an informal settlement in Brazil.*
[3] *Pele (Roberto) da Silva at the, São Paulo Calling conference.*

project and thus translated the activities of the Coletivo into a co-created practice of learning beyond the boundaries of the favela.

Values and Practices

Increasingly, social scientists, architects, geographers, and anthropologists who engage in questions with respect to favelas recognize the value of sharing ideas and seek interdisciplinary or transdisciplinary approaches to real-life issues.[4] Interdisciplinarity employs an innovative conceptual model to synthesize diverse disciplinary approaches in order to address a problem. A transdiscipline approach unites nonacademic participants and „local knowledge" with professionals or academics to document problems and cultivate solutions to everyday life problems.[5] Since the 1940s, problems associated with favelas have conventionally fallen within the realm of the social sciences.[6] The social sciences, however, have generally not linked social findings to specific spatial realities.[7] Architecture sought to address this gap, however notoriously falls short of addressing social issues due to a romanticizing of the aberrant geometries and the perpetual state of construction characteristic of favelas.[8] The Learning on the Ground project sought to explore these discipline-specific shortcomings by demonstrating how social phenomena are related to specific places. Joining the disciplines of art, architecture, planning, geography, and education to do so, the Learning on the Ground project is interdisciplinary. Because the project asks favela residents to map social phenomena and illustrate interpretations of space from the ground up, the project is transdisciplinary.

In the context of a favela, where the words interdisciplinary and transdisciplinary mean little to residents, and in the context of Brazil, where disciplinary silos are particularly stubborn, the largely theoretical approaches of interdisciplinarity and transdisciplinarity required renovation. The Learning on the Ground project thus embraced a set of values as a way to talk about what we do and why we do it with a wide range of participants. As such, the Learning on the Ground project demonstrates how practice – formal or informal – is shaped by values. These values establish the boundaries of the activities of the practice and mediate between the practice and the surrounding context.[9] The adoption of the values of service, proximity, and experimentation thus challenge spatial, social, and disciplinary boundaries conventionally associated with favelas.

[4] *Graybill et al 2006.*

[5] *Jameson 2001; Tress et al. 2003.*

[6] *See Perlman 1972 and 2010; Gilbert and Ward 1982.*

[7] *Harvey 2000.*

[8] *Dr. Ann Varley, in a lecture at the University of Texas. March 07, 2011.*

[9] *Perkes 2009.*

Service

Service is the identification of community needs and development of solutions that address those needs. Typically, favelas are „served" when they are mapped, drawn, and „urbanized" by experts from the outside. Maps are often derived from aerial photographs, which demonstrate spatial and material discontinuity between „formal" and „informal" parts of the city and thus rationalize a development project. While social workers and the Department of Health employees gather data about the people who live in favelas, this data is not linked to specific places. Therefore, „maps" of favelas and often the resultant project are one-sided and largely disregard social information that could be useful for considering solutions. By asking residents and children to map the spaces of their community, the Learning on the Ground project took a synthetic approach to map-making, suggesting that maps are subjective and thus negotiable. If maps of favelas are subjective and negotiable, what it means to service or „urbanize" favelas can also be considered to be negotiable.

Like most other favelas, children of Bamburral face severe deficits in access to quality education and specifically to creative arts, experiential learning. Schools that serve children who live in favelas generally adhere to standardized and rigid curriculums and have poor relationships with the communities that they serve.[10] This point of view comes from a universal, „one size fits all" public education system implemented by the military dictatorship in the 1960s where the school is a refuge from the ills of the favela. Yet notoriously weak teaching skills and a four-hour school day leave children from favelas discarded in the classroom and on the street for the majority of their waking hours.[11] The Learning on the Ground project seeks to serve the particular needs of its participants through continually considering what is needed, which was found to be creative arts education that fills time unattended by the public school system. This discovery emerges from proximity on a day-to-day basis, cultivating an understanding of the specific challenges that residents and children of favelas face.

Service, then, encompasses both the action of listening to actual needs and the implementation of activities that would map and narrate the community from the inside out. The technologies of film, photography, and GIS coupled with existing digital maps employed by the

[10] *Plank 1986.*

[11] *Paiva 2010.*

Learning on the Ground project allowed children to „teach" outsiders about the meaningful aspects of their communities in ways legible to many different kinds of people. Such „lessons" contributed to the children seeing their community and themselves differently and shifted perceptions in how favelas and children from favelas are perceived by the public.[12]

Proximity

„Moro aqui mas não significa que não queira o melhor para os meus filhos, não significa que sou preguicosa, e não significa que trata com droga. Sou um citadão, e os meus filhos são citadães."

„I live in a favela, but it doesn't mean that I don't want the best for my kids, it doesn't mean that I am lazy, and it doesn't mean that I am a drug dealer. I am a citizen and my children are citizens."
– Pele, father of Learning on the Ground participants Willy, Issac, and Paloma.[13]

The poor, and where the poor live, have often been subject to outside opinions.[14] In contrast to dependency theorists, who saw people in favelas as lazy and as a result in need of „expert" advice, it was John Turner who first suggested that people who live in favelas are the best judges of needs and builders of solutions. If we follow Turner, the questions then become 1 – What does the experience of living in a favela bring to bear on the urban environment? 2 – How can these experiences be located, documented, and applied to solutions that mitigate „wicked" problems?[15] Janice Perlman's work in the Rio favelas in the 1970s provides a clue to the first question. Perlman believed that to rigorously challenge the notion of favelas as decrepit places where people who „drained" public resources and stole public space resided, she had to insert herself in those very places. In other words, Perlman got her hands dirty by living in Rocinha, Rio's largest favela, for three years.

In São Paulo, Dr. Maria Ruth Amaral de Sampaio is perhaps the best example of an activist – researcher or, an academic who researches informal communities, advocates on residents' behalf, and assists in making concrete physical and social improvements. Sampaio has been

[12] A consistent theme at the Silo Paulo Calling conference, where the „Barnburral: O meu lugar" film was shown, was how the children's visions re-framed common perception of favela children as „needy".
[13] I received Pele (Roberto) and his wife Paula's cell phone number from the sub-municipality office of Perus, where the Bamburral favela is located. Their veranda was the first permanent classroom of the Coletivo until it was demolished in 2011 to make way for an urbanization project.
[14] Gilbert and Ward 1985.

intimately involved with a squatted building, the Unity Building, for 12 years and her actions and work have been recognized and awarded within Brazil and abroad.[16]

In a similar vein, the Learning on the Ground project derived from proximity to daily life in the Bamburral and Arvore São Tomas favelas. Differently than Perlman and inspired by Sampaio, the Learning on the Ground project sought to involve diverse participants, extending the benefits and experience of the project beyond one researcher. Insertion into day to day life sometimes involved following kids around in order to understand their interests and activities, drinking coffee in someone's home, or watching a children's show on television. These activities, which tend to become lost or undervalued when a proposed „project" articulates certain programmed activities, began to fill gaps between my structured agendas and the reality of the Bamburral and Arvore São Tomas favelas. This discrepancy shapes what Bent Flyvbjerg describes as context dependent knowledge, derivative from „the difference between what we want to happen and what actually happens in a place."[17] Proximity allowed me to experience the importance of following tacit clues and contextual nuance rather than adhere to a rigid plan. As a result, these discoveries inspired new directions.[18]

Experimentation

For the pragmatist, the process of inquiry has a practical starting point. Rather than adhering to abstract, „expert" philosophical premises that rely on singular perspectives of reality,

[15] Rittel and Webber 1973. A „wicked problem" is a problem that is extraordinarily difficult to solve and is characterized by the interseetion of many issues, most of which are opaque and ever-shifting.

[16] In 2001, Dr. Sampaio, when she was Dean of the University of Silo Paulo School of Architecture, first asked me to photograph the Unity Building. My professional trajectory is largely a result of her continued influence and she continues to be a mentor to this day.

[17] Flyvbjerg 1998.

[18] An example is the television. After having never had a television in my life, watching television with children, from soap operas to children shows, was extraordinarily challenging. Yet I began to understand the kinds of things kids liked about the particular shows and ultimately how television, since it is so central to life in a favela, might be a medium through which to re-think how the activities of the Coletivo might achieve a broader reach or, how it might "Learn on the Ground." For the Silo Paulo Calling exhibit and conference, we made 250 OVOs of the film "Bamburral: 0 meu lugar" (Bamburral: my place), which we distributed to the professional and international audience that attended the conference and throughout the Bamburral and Arvore Silo Tomas favelas. The lesson learned is the importance of consistent self reflection and permeability to different forms of learning.

knowing and the known are perceived „as forming together one event for inquiry – one transaction – since, in any full observation, if one vanishes, the other vanishes also."[19] Knowing is understood through interactions with an ever-shifting context, where the mind is an active participant in the absorption and creation of knowledge.[20] Since the years of the dictatorship, the public school system in Brazil has focused on ends: universalization, meeting test scores, inserting more children into classrooms, building new schools, emphasizing rote memorization and repetition. Coupled with a four-hour school day and notoriously weak materials and school spaces, Brazil's public education system is currently on par with countries like Ecuador and Bolivia while economically competing with China, Russia, and India. Knowing in the context of Brazil is perceived as a fixed reality which all people should strive to reach in the absence of tools. The unknown, then, is a forbidden topic that lurks in the background as a favela „lurks" at the outskirts of the city.

In contrast, the Learning on the Ground project understands knowing through the unknown and implements activities that are experimental and largely without set outcomes. Given that the participants are in school for only four hours a day, the Learning on the Ground project occupied time in which the participants were normally engaged in other self-driven activities. In this sense, the Learning on the Ground project responds to a challenge put forth by Brazilian anthropologist Darcy Ribeiro when he was Secretary of Education in Rio in the 1980s: to keep children educated „the school must compete with the street." The activities of the Learning on the Ground project took place on the street and were designed to be layered and flexible so as to accommodate different ages, interests, and attention spans. On more than one occasion, mappings of circular shapes, the color green, and beauty salons supplanted mappings of important places because these phenomena were more concrete. Further, when the Bamburral favela entered a state of demolition and participants moved to the Arvore São Tomas favela, mapping and drawing became activities whereby existing participants discovered new places and thus taught new participants about the project. As such, the experiments were practical because they tracked not only ever-shifting needs but responded to an ever-shifting context.

Mental Maps

„The city that we seek conditions the city that we find." [21]

In addition to mapping the relationship between factual social phenomena and space, the activities of the Learning on the Ground project generated mental maps. Mental maps

[19] *Oewey and Bentley 1949.*
[20] *Oewey 1931.*
[21] *Sharpe and Wollack 1987.*

demonstrate how people construct the city and neighborhood through imagination and memory. As can be understood through the words of Larissa and Pele, participants are everyday people who have a specific relationship to a place or series of places. By documenting where these constructions converge and diverge, we can understand the favela as a dialogue between different interpretations and thus understand the collective identity of the Bamburral and Arvore São Tomas favelas. How a child perceives him or herself within a community or a space is a critical component to considering solutions that address the specific needs of children from favelas.

For the Learning on the Ground project, mental maps became a collage of drawings, photographs, GPS points, and walking paths superimposed upon the city's digital maps of the Bamburral and Arvore São Tomas favelas. During mental mapping exercises, children and adults walked through the community and mapped favorite places and significant points of gathering using a handheld GPS device. These points were then added to the city's digital map of the Bamburral and Arvore São Tomas communities. Children drew pictures of their favorite places, which were then collaged into the drawing along with text of children's interpretations of those places.

In Portuguese, mental map is translated as „mapa falado“ or „spoken map“. When the Learning on the Ground participants were invited to produce work for the São Paulo calling exhibit and conference, we appropriated the Portuguese understanding of mental map. Given that illiteracy is still a significant issue in Brazil, the idea that verbal narration and what can be considered „classic storytelling“ using modern video technology became an appealing option. Therefore, the final exercises of the Learning on the Ground project resulted in a film that translated a physical map into a visual and oral „telling“ of the Bamburral and Arvore São Tomas favelas.

Presented on May 12 at the São Paulo Calling exhibit and conference, „Bamburral: O Meu Lugar“ (Bamburral: My Place) is a film inspired by the Brazilian pedagogue Anisio Teixeira. For Teixeira, children from poor backgrounds have distinct challenges and potentials that should thus shape their education. Teixeira, a lawyer turned educator, developed the Escola Parque (Park School) together with architect Hélio Duarte in 1947. Teixeira, having studied with American pedagogue and pragmatist John Dewey, and Duarte, who borrowed directly from the German Bauhaus, designed the Escola Parque to mitigate those challenges and build on potentials. The school was designed as a series of buildings and workshops that housed a flexible, context specific curriculum. In his seminal work, „Education is not a Privilege“, Teixeira challenged Brazil's elitist educational system and articulated the importance of education that relies on the specific visions, needs, and imaginations of the ultimate users of the public school system: poor urban youth.

The film „Bamburral: O Meu Lugar“ uses nine drawings to articulate the meaning of nine significant places in the Bamburral and Arvore São Tomas favelas. Older participants interviewed the designers of the drawings with respect to the meaning of the places and why particular drawing methods were employed. The favorite places ranged from private spaces („my house'“) to events („dia das crianças“) to places („the church“), The common theme emergent from this exercise was the collective nature of action and education. Describing his drawing of the staircase where the Learning on the Ground project painted a mural, one participant described the staircase as the place „where I learn to be a citizen“. His drawing shows that learning is collective and about being a citizen. The film was also entirely produced by children, who thus learned the Adobe Photoshop and Premier programs. The Bamburral: O Meu Lugar film aligns with the philosophy behind the Escola Parque because it identifies learning to specific places or, context and as experiential. As a process and an outcome, the film embodies how constant searching on the part of participants transformed the city „as found“ into a city „as imagined“.[22]

[22] *Brazilian urbanist jaime Lerner emphasizes the importance of dreams and imagination in crafting cities „from the bottom up“.*

A Practice of Learning: four re-framings

Educação (education), in Portuguese, has dual meanings that are tacit and explicit. „Educada" refers to the achievement of a formal education and also to the use of informal or tacit manners for navigating the world. Therefore, we can interpret educação as a mediation between the formal and informal or, a hybrid condition that involves both tacit and explicit ways of interacting and interpreting the world. While gains have been made in the area of public school education since the 1970s, Brazil still lags far behind its neighbors and economic rivals in Latin America and in other world regions.[23] Low teacher salaries, four hour school days, poorly serviced, decrepit school buildings, and high rates of grade repetition and drop out paint a bleak picture of why Brazil continues to fail with respect to educational development.[24] The majority of children (un)served by this system are poor and a significant portion of this group lives in a favela.[25] Daily life and sustenance in a favela is largely driven by practical knowledge and „know how". Yet rather than acknowledge this, the public school system in Brazil negates the double meaning of education as „between" formal and informal, leaving the tacit, practical knowledge out of what education „should" be.

The Learning on the Ground project reframes education in four primary ways. First, by identifying the Bamburral and São Tomas communities as active spaces for learning and favelas as resilient urban neighborhoods, the project worked to further debunk conventional notions of favelas as unproductive places. Janice Perlman's seminal work in the Rio favelas of the 1970s was critical for debunking Dependency Theories and Center-Peripheral models, where informal settlements and favelas were seen as a drain on the larger public good and thus regions to be cleared rather than communities of people from which to learn.[26] Perlman's work spurred further studies in the social sciences that examined specific ways in which the resilience of informal communities is related to building practices, opening up the discussion of the role of „self-help" in housing policy.[27] The Favela Bairro project in Rio was the first implemented project to reflect a policy shift that learned from, rather than negated, the everyday practices of the poor in resolving life challenges. Education policy and projects, however, have not integrated self-help practices as has housing policy. The Learning on the Ground project, then, builds on the integration of self-help practices into housing policy and considers how education might follow a similar model.

[23] *Plank 1996.*
[24] *Plank 1996.*
[25] *Paiva 2010.*
[26] *Perlman 1976, 2010.*
[27] *Gilbert and Ward 1985.*

Second, through exercises with film and photographic technologies, children became the story tellers and thus „teachers" of their own communities. Conventional education in Brazil notoriously favors expert knowledge.[28] Lay knowledge or knowledge of individuals who have not been „educated" in education is therefore considered less valuable. Paiva discusses the „favela effect" whereby teachers in the public school system keep an arm's length from their students, reflecting the perception that the context and people from where students come is unrelated to being educated. In contrast, the Learning on the Ground project suggests that practical knowledge and context, including favelas, has much to do with being educated. Building off of Turner, here children can be considered appropriate judges of their needs. Given the interpretations of education as a collective action, children, then, are teachers as much as they are learners.

Third, through occupying unused spaces in the favela, the Learning on the Ground project transformed these areas into a network of small community centers. Building off of the work of Perlman and Turner, which demonstrated the resiliency of favelas, Gilbert and Ward asked a simple question: so what now? Harvey later called for an integration of what he refers to the geographic and sociologic minds, arguing that we must think about space and its social fact in tandem if real changes are to be achieved. Harvey suggested, aligning with Ribeiro, that a fusion would emerge from actions on the street.[29] In other words, what are the political and spatial consequences of understanding favelas as resourceful neighborhoods and action on the street as valuable „data". The Learning on the Ground project occupied spaces in the favela as a way to demonstrate how space is both materially and socially produced.

Fourth, by involving children and adults from the Bamburral and Arvore São Tomas favelas, architecture students from the Escola da Cidade, and presenting work at the São Paulo Calling conference, the Learning on the Ground project established a transdisciplinary approach to education. As I have already discussed, formal education in Brazil tends to favor expert knowledge from the field of education. Architectural education in Brazil continues to follow the modernist tradition, whereby the site of architecture often begins with a blank slate. Existing social information, therefore, is often irrelevant and „impure" to the practice of architecture. Finally, maps that distill information represent the city, distilling information in favor of introducing complexity or the messiness of everyday life. The diversity of actors involved in the Learning on the Ground project suggest that problems are complex and that many different kinds of knowledges are required in their solution.

[28] *Plank 1996.*

[29] *Harvey 2012.*

In contrast to traditional learning research, where learning is seen as an activity of the individual learner's mind, the Learning on the Ground project reframes education from the perspective of diverse „tellings“ and „views“ of the lived-in world of favelas related to actual spaces. The Learning on the Ground project achieved these reframings by embracing the etymological roots of „educação“. As such, the project occupies a middle ground that derives from particular values so as to interrogate an ever-changing boundary between two conditions: formal/informal; thought/experience. Through action in real life conditions, the Learning on the Ground project articulates a practice of learning based on critical dialogue between conventionally separate realms.

Dialogue

The dialogue emergent from the Learning on the Ground project demonstrates that the boundaries between the formal and „informal city“ are often a complex social and physical interface that belies the simplistic delineations represented by maps or planimetric views made possible by Google earth. Beyond the aberrative geometries, material properties, and spatial differentiation of favelas visible to the naked eye, boundaries between the formal and informal realms often determine those citizens who have access to particular life opportunities within the city, and those who do not. The Learning on the Ground project ultimately established a precedent for reconfiguring boundaries between the favela and improved life opportunities, relying on the lessons of the former to inform the latter. Hence the hope is that the established dialogue extends beyond the length of the project and encompasses what Brazilian pedagogue Paulo Freire referred to as conscientization, which „occurs by means of dialogue, during which people share information on institutional injustices and challenge powerful interests so as to change their own everyday realities.“[30]

While the practices of the Coletivo de Arte do Bamburral generated new dialogues within the favela, the Learning on the Ground project extended that dialogue beyond the favela. The Learning on the Ground project, then, demonstrated that co-created knowledge is possible and sustainable as long as new actors continue to participate. Leonie Sandercock explores the value of adding new interpretations of ever-changing contexts like favelas and how these interpretations and narratives affect larger urban stories. Sandercock argues „in order to imagine the ultimately unrepresentable space, life and languages of the city, to make them legible, we translate them into narratives. The way we narrate the city becomes constitutive of urban reality, affecting the choices we make, the ways we then might act.“[31] It is the ultimate hope of the Learning on the Ground project that through co-creating narratives

[30] *Friere 1972.*

[31] *Sandercock 2003.*

about the Bamburral and Arvore São Tomas favelas that both the stories and the lessons learned in the process will endure in the lives of the people who participated. The Learning on the Ground project can be understood, then, as establishing a dialogue where future tellings about the Bamburral and Arvore São Tomas favelas and the people who live there will render communities conventionally invisible or unvalued as legible, valuable, and useful parts of the urban realm.

Conclusion

The activities of the Learning on the Ground project resulted in a series of tools and documents that could be instrumental toward development that serves the specific needs of community members, specifically with regard to education. The project demonstrated that despite many negative connotations, favelas are places of resilience and have the potential to be civic spaces that unite social and technical realities of São Paulo's built environment. Bamburral and Arvore São Tomas, described by a past sub-mayor as „the worst case scenarios of a worst case scenario" because they flank the Bandeirantes garbage dump, were shown to have incubated a group of children whose actions supersede expectations and whose commitment grew through adversity. Through a shared set of values and creative technologies, these children actively „talked back" to low expectations in the context of a failing educational system and a segregated society.

By telling the stories of their communities from specific places and mapping narratives graphically, the Learning on the Ground participants re-framed education, suggesting that learning is more nuanced and context dependent than what is currently being offered in the public school system. Returning to Anisio Teixeira and John Dewey, such a radical approach approximates the original meaning of Pragmatism, which is „radical".[32] Coincidentally, the programs and approach of the Secretary of Housing (SEHAB) of São Paulo have recently been described as radical, because of the extent to which they not only incorporate disciplines outside of the areas of planning and architecture but also people who have conventionally existed outside of the public realm of producing projects for people who live in favelas: the residents themselves. These projects, referred to as „urbanization of favelas" projects, seek to improve the lives of people who live in favelas through improved physical conditions. The Learning on the Ground project established materia prima for implementing improvements in education beyond physical solutions: a co-created practice of learning on the ground, from the favelas Bamburral and Arvore São Tomas. Given the interest and success of SEHAB in applying informal practices to the improvement of housing and public space, it is reasonable to suggest that SEHAB might utilize the lessons learned and work produced from the Learning on the Ground project. A first recommendation would include a return to the approach taken by Anisio Teixeira and Helio Duarte in the 1940s, whereby spaces in the community already being used informally for education

become renovated in the context of urbanization projects. These spaces would physically expand existing schools and give spatial definition to a radical form of education: one that is not a privilege nor „universal“ but ongoing, exploratory, and derivative of everyday life in favelas.

Bibliography

Carr, Wand S. Kemmis (1986) Becoming: Critical Education, knowledge, and action research, Lewes: Falmer.

Dewey, John (1931) Context and Thought. Berkeley: University of California Press.

Dewey, John and Robert Bentley (1949) Knowing and the Known. Boston: Beacon Press.

Flyvbjerg, Bent (1998) Rationality and Power, Chicago: University of Chicago Press.

Friere, Paulo (1972) Pedagogy of the Oppressed. New York: Contiuum.

Gilbert, Alan and Peter M. Ward (1985) Housing, the State, and the Poor. New York: Cambridge University Press.

Graybill, Jessica K. Sarah Dooling, Vivek Shandas, John Withey, Adienne Greve, and Gregory L. Simon (2006) „The Rough Guide to Interdisciplinarity“, Bioscience 56 (9).

Harvey, David (1996) Justice, Nature, and the Geography of Difference, Malden, MA: Blackwell.

Harvey, David (2000) Spaces of Hope, Berkeley: University of California Press.

Harvey, David (2012) Rebel Cities: From the Right to the City to the Urban Revolution, New York: Verso.

James, William (1907) Pragmatism, New York, Longmans Green.

Jamison, Andrew (2001) The Making of Green Knowledge: Environmental Politics and Cultural Transformation, Cambridge, UK: Cambridge University Press.

Paiva, Angela Randolfo and Marcelo Baumann Burgos, eds. (2009) A Escola e a Favela. Rio de Janeiro: Editora PUc.

Perkes, David (2009) „A Useful Practice“, Journal of Architectural Education, 62(4): 64–71.

Perlman, Janice (1976) The Myth of Marginality, Berkeley: University of California Press.

Perlman, Janice (2010) Favela: Four Decades of Living on the Edge in Rio de Janeiro, New York: Oxford University Press.

Plank, David N. (1996) The Means of Our Salvation: Public Education in Brazil, 1930–1995, Boulder, CO: Westview Press.

RitteI, H. and M. Webber (1973) „Dilemmas in a General Theory of Planning", Policy Sciences, 4: 155–159.

Sandercock, Leonie (2003) „Out of the Closet: The Importance of Stories and Storytelling in Planning Practice." Planning Theory and Practice 4 (1): 11–28.

Sampaio, Maria Ruth Amaral de, ed. 1998. Habitação e Cidade. São Paulo: FAU-USP, FAPESP.

Sharpe, W. and Wollack, L. (1987) „From 'great town' to 'non-place urban realm': Reading the Modern City", in W. Sharpe and L. Wollack, Visions of the Modern City, Baltimore: The Johns Hopkins University Press, 1–16.

Teixeira, Anisio (1953) Educação não é Privilégio, Rio de Janeiro: Editora UFRJ.

Tress B., G. Tress, G. Fry eds. (2003) „Potential and limitations of interdisciplinary and transdisciplinary landscape studies", in in Tress B, Tress G, van der Walk A, Fry G, eds. Interdisciplinary and Transdisciplinary Landscape Studies: Potential and Limitations. Wageningen (The Netherlands): Delta Program.

Turner, J. F. C. (1967) „Barriers and Channels for Housing Development in Modernizing Countries". Injournal of the American Institute of Planners 33.

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Impressum
Briefe zur Interdisziplinarität
ISSN 1865–8032

Herausgeber:
Andrea von Braun Stiftung
Mauerkircherstraße 12,
D-81679 München
office@avbstiftung.de

Redaktion (Adresse wie Herausgeber):
Isabella Weinberger, M.A. (verantwortlich)
Dr. Christoph-Friedrich von Braun, M.Sc.

Verlag: oekom verlag, Gesellschaft für Kommunikation mbH
Waltherstraße 29, D-80337 München
Tel. + 49 (0) 89 54 41 84 - 0
Fax + 49 (0) 89 54 41 84 - 49
E-Mail kontakt@oekom.de, www.oekom.de

Gestaltung & Satz:
Grafik·Design Weinberger-May, München
www.weinberger-may.de

Anzeigen:
Stefanie Ott
(verantwortlich, Adresse wie Verlag)
Tel. + 49 (0) 89 54 41 84 - 35
anzeigen@oekom.de

Druck: Kessler Druck + Medien
Michael-Schäffer-Straße 1,
D-86399 Bobingen

Erscheinungsweise: zweimal im Jahr

Bezugsbedingungen:
Jahresabonnement 30 EUR,
Einzelheft 19,80 EUR.
Alle Preise inkl. MwSt., zzgl. Porto- und Versandkosten.

Abbestellungen sechs Wochen vor Ablauf des Abonnementjahres. Zahlungen im Voraus.

Abonnementverwaltung:
Rhenus Medien Logistik GmbH & Co. KG
Auslieferung oekom verlag
D-86899 Landsberg am Lech
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