



# "Science meets Dharma"

## Continuous Science Classes in Tibetan Exile Monasteries

### Status Report of the Project

August 2018

#### Abstract

Right from the start, the unique feature of *Science meets Dharma* was the fact that science is being taught to monks and nuns within their own monasteries on a continuous basis (e.g. five times a week). Following a suggestion of His Holiness the Dalai Lama, the Project was started some 17 years ago in 8 monasteries of the Gelugpa Tradition in South India. Since then, it has developed through various phases and is presently concentrating on the collaboration with monastic institutions of all Tibetan traditions in all parts of India and Nepal.

The present status report sums up some of the experiences of "Science meets Dharma" over the past 17 years, giving due emphasis to the fundamental change in the project's concept after 2014. The present report also spells out four major guidelines which *Science meets Dharma* has framed for its present and future activities. These guidelines are the following:

- In order to acquaint monastic students with the spirit of Western science, teaching should be focused on exploring and observing nature by means of experiments undertaken by the students themselves. Only few, but well-chosen examples from different fields of science should be taught, the purpose being to elucidate Western ways of scientific thinking, not simply to encourage memorizing of scientific facts.
- As a door opener for nunneries and monasteries of all Tibetan traditions, it is very meaningful to organize *Science Introduction Workshops* at the very location of these nunneries or monasteries. As experience shows, this approach not only makes studying easier for nuns or monks, but also allows the monastic decision makers to form their own idea about what it practically means to introduce science teaching in their monasteries or nunneries.
- Wherever monastic authorities show interest in exploring ways and means to introduce science as a subject of regular study, *Science meets Dharma* will assist them in various ways. The basis of such support is constituted by the respective decisions taken by a Conference of all Traditions in Dharmasala from 14. through 17. May, 2013.
- *Science meets Dharma* is prepared to join hands with other institutions in the planning and implementation of any long-term concept for the training of monastic science teachers.

Comments and Suggestions with regard to any point of the present report, especially to the above four guidelines, are highly welcome!

## Overview

1. Introduction: The Mission and the Goal of *Science meets Dharma*
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### 1. Introduction: The Mission and the Goal of Science meets Dharma

In 1998, His Holiness asked the Tibet Institute Rikon to initiate a project with the aim to bring Western Science to Tibetan monks and nuns in India. Subsequently, the so called *Science meets Dharma* – Project was started in 2002 in eight monasteries in Karnataka.

**The Project's Mission** can be described in the following context:

Tibetan Buddhism, in the past 50 years, has opened itself considerably to the Western world. This is a consequence of the rising number of Tibetan Refugees living all over the globe, but especially in India. Thus, Tibetan laypeople are inevitably living in a modern globalized world, but still are – luckily! - very much attached to their own traditions. They are exposed to the tension between a modern technical world and their Buddhist culture. At the same time, monks and nuns, too, even though living in monasteries, are more and more exposed to globalized contexts. After having finished their monastic studies, they often go out into the world, which is dominated by the Western way of living and reasoning. They are no longer protected by a closed environment, neither in their monastery nor in their homeland. They are challenged to live in and to cope with people and systems dominated by Western rationale.

On the other hand, Western science is approaching its limits, because it is mainly built on models by which - for many centuries - it had seemed possible to explain all phenomena of nature's behaviour. This assumption does not hold true any longer, as - e.g. in quantum physics - the propagation of light cannot be described in a single way, but needs two seemingly contradictory models to be understood (Dualism: electromagnetic wave against photons). In the West, therefore, awareness is slowly growing that new (hitherto unknown) ways of reasoning and conceptualizing might be necessary even for scientists, in order for them to understand reality. Would Buddhist Philosophy possibly offer such a new stimulus?

Thus, the overall mission of *Science meets Dharma* is to contribute to the creation of the necessary preconditions for a stimulating dialogue between Buddhist Philosophy and Western Science. His Holiness has personally formulated this idea by the following words:

*"It seems to me that Western science and Eastern philosophy can join together to create a really complete and full-fledged human being. (.....) What in fact interests me is what is beyond matter and awareness, what really is important and what makes us what we are."*

The Dalai Lama (1999): *The Path to Tranquility: Daily Wisdom*. Penguin. p 106

It was in such a perspective that the following **two project goals** were formulated for *Science meets Dharma*:

- To enable Tibetan monastics to dialogue among themselves as well as with Tibetan lay-people not only on traditional topics, but also on problems arising from their common social, economic and technical environment. How is it possible to realize Buddhist values and Buddhist spirituality in a globalized world?
- To also enable Tibetan monastics to enter into dialogue with non-Buddhist people from the West and to jointly reflect on the problems threatening our globe. What can Science and Dharma jointly contribute to promote world peace, to alleviate suffering and to preserve life and beauty on our globe?

To study science is one possible and effective way to become acquainted with the Western way of thinking and reasoning (a kind of Socratic discussion).

## 2. The Project's First Phase (2001 - 2011):

### **At that Time, the Key Responsibility to Organize Science Classes in the Monasteries was in the Hands of Expatriate Teachers**

The first project phase covered the period 2001 to 2011. During this time, selected monks and nuns from eight monasteries (in Mundgod: Drepung Gomang, Drepung Loseling, Gaden Shartse, Gaden Jangtse and Jungchup Choeling; in Bylakuppe: Sera Mey, Sera Jey and Tashi Lhunpo) have been attending daily science classes during two hours. Western teachers, supported by Tibetan or Indian instructors, were dealing with basic subjects in mathematics, physics, chemistry, biology, earth-sciences and sometimes in English. Over 10 years, a total of 39 western teachers were serving, each of them 6 to 24 months, and a maximum of four were present at the same time. In both places, Mundgod and Bylakuppe, two classes were running with an average of 25 students each. They were considered optional and were offered during the monastics' free time at noon, two lessons a day, five days a week. All together, during the project's first phase, some 300 nuns and monks got a four-years science education. In Mundgod as well as in Bylakuppe, a Geshe acted as coordinator, managed the local project office and served as a liaison person with the monastic authorities.

The first phase of *Science meets Dharma* was conceived as a pilot project, its purpose was to find out how science could be taught to monks and nuns who had almost no previous knowledge in the respective subjects. Were they interested? Could they follow the lectures? Would they adjust to the scientific way of reasoning? Another key issue was the development of an appropriate curriculum fitting into the framework of 4 years of study. Many bilingual (Tibetan – English) scripts and worksheets were produced. And finally, much attention was given to appropriate teaching methods. As a result of all these efforts, *Science meets Dharma* today disposes of a vast experience not only in the choice of appropriate topics for study, but also in the didactics needed to teach them.

*Science meets Dharma* had (and still has) no intention to provide students with anything like “full knowledge” in any scientific subject. Rather, we carefully choose typical examples to give students a lively idea of how Western science proceeds. For this reason, special focus was always given to practical scientific experiences in the classroom or within the monastery precincts, i.e. to the arrangement of simple experiments, to the observation of these experiments and to their subsequent analysis. Although memorizing certain facts and formulae is obviously necessary, *Science meets Dharma* puts more emphasis on the students' practical experience, on in-depth understanding of scientific methods and logical reasoning. This – in our view – is one of the key conditions for a fruitful future dialogue between East and West.

### 3. The Project's Interim Phase (2012 - 2014): The Gelugpa Monasteries Took over Full Responsibility for Organizing Science Classes

During the year 2011, it became evident that the time had come to change and adapt the concept of the Project. Important objectives of the first phase had been reached, and genuine interest of the monasteries in science teaching had become evident. Based on the advice of the two project coordinators (Geshe) of Mundgod and Bylakuppe, *Science meets Dharma* and the monasteries agreed that the responsibility for running science classes would hitherto rest with the monastic authorities. They would be searching and paying the teachers, would provide the classroom and facilities and offices, and they would arrange science-teaching as a part of their monastic curriculum. In the longer run, science classes were to become compulsory for all monks and nuns of a certain level, and no expatriate teachers would play any major role any more.

The new project phase started in January 2012. Within 5 months, all eight monasteries had adopted the new frame. In the beginning, *Science meets Dharma* was supporting the respective authorities to find teachers. Also, during the first year, the finances to cover the teachers' salaries were provided by the Project. These transitional measures made it easier for the monasteries to gradually take over their new responsibilities.

Of course, this transition was greatly facilitated by important decisions taken among the Gelugpa monasteries. These decisions aim at integrating science as a regular subject within the monastic curriculum. The respective teaching should run over six years. Four out of these six years would coincide with the last four years of regular monk/nun monastic studies, finishing with an internal exam. Two more years of science studies would coincide with the first years of Geshe education, ending with an external exam, which would be the same for all students of all Gelugpa monasteries. It is planned to have daily science classes of one or two hours duration over 6 days per week. The curriculum was to be developed by the Library of Tibetan Works and Archives.

All this represents an enormous challenge for the monasteries. Therefore, during the interim phase of the project, the Tibet-Institute Rikon decided to assist the monasteries of Bylakuppe and Mundgod to the best of its possibilities. *Science meets Dharma* offered support in the following areas:

- Recruitment of qualified teachers
- Coaching the teachers, especially those with little or no teaching experience
- Organizing and financing short term teachers' trainings (Crash courses)
- Acquisition of visual aids and instruction in their use
- Support in developing of teaching plans that conform to the needs and physical limitations of the individual monasteries

The promises for the integration of science into the regular monastic curriculum are great: As already mentioned, Gelugpa monasteries jointly decided to introduce science as a regular subject. Their six years science education concept started in summer 2014. A respective curriculum was drafted at Emory University, focussing on few subjects. Teaching was assumed by expatriate scientists in annual workshops of several weeks duration, mainly during April/May.

During the same period, a Conference on Education was held in Dharamasala (14. - 17.5.2013) and attended by all Traditions (Gelugpa, Nyingmapa, Kagyuepa, Sakyapa, Bon). During this Conference, it was decided to start introducing Western science into the monastic education of all traditions. A start was envisaged for the near future. In a first step, the respective monasteries planned to have science introduction workshops of few days duration only. In the meantime, a more thorough curriculum was to be developed. Regular classes would start later.

These decisions were bold and future-oriented. However, a major challenge cropped up immediately: it stemmed from the lack of suitable teachers, assistant teachers, instructors and tutors who were willing and capable to provide continuity to science-teaching throughout the year. Experience showed that – in principle - Tibetan bachelor students can fill this gap for a maximum of one year. Their number is small, however, and after their teaching experience they want to go back to finish their studies with a master's degree. On the other hand, to find teachers "on the market" was almost impossible, because outside the monasteries a much higher salary is paid. Thus, the lack of teaching personnel at various levels proved to be a major threat to all efforts aiming at introducing continuous science classes in the monasteries. Without such personnel, the continuity and solidity of science education in the monasteries cannot be assured.

So far for the Gelugpa monasteries in Mundgod and Bylakuppe, Emory University in cooperation with Library for Tibetan Works and Archives has produced few primers (textbooks). Those books are not covering the approaches in teaching science as the project *Science meets Dharma* has developed as a result of their experiences during the first project phase. Best would be to translate selected chapters from P.G. Hewitt's textbook "Conceptual Integrated Science". This book meets the methodical and didactical needs perfectly as we experienced it with the project *Science meets Dharma*.

#### **4. The Project's Second Phase (2015 - today): Towards Introducing Science Classes on a Continuous Basis in Monasteries of all Traditions**

As already mentioned, in May 2013, the "Conference on Development of Education of four Major Tibetan Buddhist Schools and Bon Tradition" took place in Dharamasala, attended by delegates from all 51 Buddhist monasteries in India and Nepal. Among other things, the participants decided that Western natural science should be introduced as an educational subject in the foreseeable future in the monasteries of all traditions. Moreover, it was decided that until the individual monasteries would be able to begin regular science classes, "Intensive Weeks" including scientific topics would be introduced..

In view of these decisions, *Science meets Dharma* has set for itself two new tasks for the present second phase of the project. These tasks are (1) to offer "Science Introduction Workshops" and (2) to support Monasteries in their endeavours to introduce regular science classes.

##### **4.1 Science Introduction Workshops in Monasteries all over India and Nepal**

Consequently, *Science meets Dharma* has developed two different one-week "Science Introduction Workshop" (level 1 and level 2) which, in collaboration with the Ministry of Religion and Culture of the Tibetan Exile Government, are presently being offered to exile monaster-

ies in all areas of India and Nepal. In both workshops, through the use of special examples in mathematics, physics, chemistry and biology, including numerous observations and individually carried-out experiments, the participants are offered a gateway to Western natural sciences. Rather than memorizing, it is more important at the moment to demonstrate to nuns and monks how natural science experimentation and deduction works. The level 1 workshop deals with questions as to why and how Western natural sciences should be taught in the monasteries. The main focus is on applied mathematics, physics and biology, where plants are investigated. In chemistry, the monks and nuns explore the burning process with candles. In the follow-up workshop (level 2), they can build on their previous experience and knowledge, and they can intensify their own scientific inquiry. The over-all focus of such inquiries is on the sense organs of animals and humans.

For such Science Introduction Workshops a team of Swiss teachers visit selected nunneries or monasteries, which have previously applied for such a workshop. As a general rule, 20 to 35 monastics are participating. A workshop includes up to 6 lessons per day over 6 consecutive days. This approach offers big advantages: On the one hand, the monk or nun students can remain in their familiar monastic environment, on the other hand, monastic authorities and decision makers have a chance to sit in the classes and to follow the teaching as well. Thus, they get a vivid impression of what it practically takes and means to study science.

Up to now (summer 2018) a total of 13 Science Introduction Workshops has been taught in monasteries and nunneries in Dharamsala, Dolanji, Puruwala, Dehradun, Chandragirtpi and Kathmandu.

#### **4.2 Support to Monasteries in their endeavour to introduce science as a regular subject of monastic education**

If – based on the observations and experiences during such *Science Introduction Workshops* – the responsible authorities of a nunnery or monastery show interest in more detailed and practical discussions, *Science meets Dharma* sits with them and offers support. This support – according to the specific circumstances – may include:

- In cooperation with the concerned authorities of nunneries or monasteries, *Science meets Dharma* will develop a science curriculum and a corresponding syllabus outlined for e.g. four years.
- Active assistance in seeking and recruiting qualified Tibetan science-teachers who are capable to conduct science classes on the basis of and in consonance with the agreed curriculum;
- Regular coaching of the above mentioned teachers by experienced Swiss science teachers visiting the monasteries/nunneries several times a year. This coaching will include preparations of forthcoming classes (content and methodology) as well as critical observation and constructive discussion of the teacher's methodology and achievements.
- Providing necessary teaching equipment, which is not easily locally available (e.g. microscope) as well as appropriate textbooks.

Such discussions have taken place in various nunneries/monasteries. However, practical implementation of jointly elaborated concepts and plans is still to be expected.

## 5. Future Perspective

During the coming years of the second project phase, *Science meets Dharma* will concentrate its efforts in the following fields:

### 5.1 Introducing Science in “new” Monasteries/Nunneries

As in the past few years, *Science meets Dharma* is ready to organize and implement – upon request – science introduction workshops in monasteries, which have not so far participated in the project. They may be situated in any part of India or in Nepal.

### 5.2 Support and assist "new" Monasteries in introducing continuous science teaching

Upon request, *Science meets Dharma* is ready to support and assist those nunneries or monasteries who show interest in introducing continuous science teaching on a regular base as a part of their monastic curriculum. They may be situated in any part of India or in Nepal.

### 5.3 Teaching Aids

*Science meets Dharma* will provide all existing teaching materials (such as bilingual scripts and worksheets in Tibetan - English) on an Internet platform, so as to make them available to all student teachers in the monasteries.

### 5.4 Curriculum and Textbook Development

*Science meets Dharma* – based on its 17-years experience in this field - is prepared to provide support to any project of curriculum or textbook or syllabus development undertaken by any institution working towards the same goals.

### 5.5. Long-term Planning of Teachers' Training

Similarly, *Science meets Dharma* is prepared – within the limits of its financial capacity - to join hands with other institutions in the planning and implementation of a long-term concept for the training of monastic science teachers.

### 5.6. Concluding Remark: Should the Study of Science be Optional or Compulsory?

Without properly formulating a respective recommendation, we have another point in mind that seems worthy of careful reflection. The question is: Is it really necessary for all monks and nuns to get acquainted with Western science? As per the experience of *Science meets Dharma*, intensive study of science might be overtaxing those students, who have already difficulties with their regular traditional education. Many management- and cost-aspects of the monastic education programmes might perhaps become easier to handle, if the study of science would be viewed as an optional, not as a compulsory course.

## A Vote of Thanks

The author of the present report thanks all persons and institutions, which have assisted him with comments and suggestions, with open-minded inputs and with their personal sincere commitment to the cause. Similar contributions are always welcome.