

## Meditation for Scientists

February 9, 2020

If I were somehow able to go back in time twenty or thirty years to meet with my past self, the first thing I would say would be, “You need to learn to meditate as soon as possible”.

When I was younger I vaguely knew what meditation was, but it didn’t have a lot of appeal. I couldn’t imagine a worse use of time than sitting and doing nothing. Maybe it could be useful for people who had a lot of problems, but I was working on important things. I was busy.

I started a daily meditation practice about five years ago. In that time, and largely as a direct result of meditation, my overall stress level has gone down by orders of magnitude. I feel vastly more at ease, more comfortable, and more at home in whatever situation I find myself in. Consequently I find myself better equipped to navigate through challenging circumstances, and far less inclined to introduce unnecessary complications through my own emotional reactions.

As a scientist, despite the time dedicated to meditation, I feel my productivity has gone up considerably. Not only am I able to concentrate better scientifically, I also feel in touch with a more stable foundation from which to practice exercising discerning judgment.

This short essay is intended to introduce, or re-introduce, my friends in science to the idea of meditation. I’ll discuss why I think meditation is particularly important for scientists, and give some pointers that may help in getting started.

### Meditation is mental training

As researchers, we think of ourselves as having highly trained minds. We’ve studied for many years to get here, done innumerable problem sets as homework, learned how to assign ourselves research tasks, and discovered things that were previously unknown. We are all experts in thinking. Certainly, it’s reasonable to say that we have highly trained minds.

Imagine an athlete who spends all their time lifting weights, working out, and becoming strong. If you would tell such a person that is there another kind of physical training, namely stretching, this person might not immediately appreciate its value. They might think, “How is that going to help me lift more weight?” Perhaps they can lift five hundred pounds but can’t even touch their toes. There is the problem here of not being able to appreciate the value of something that is outside of an established worldview.

Meditation is a highly refined technique of mental training. Its most widespread form has been stable for two and half thousand years, with roots going back perhaps five thousand years. It is as different from scientific problem solving as weightlifting is from stretching. Yet it is also in a way completely scientific, with particular effort leading predictably and reproducibly to particular results.

As a motivation for developing alternate types of mental skills, consider this quote from the great oceanographer Henry Stommel. He describes how, after accumulating enough basic information on a problem, looking at it from as many ways as possible, he reaches a point where he finds a major shift in his approach is necessary:

When my mind is filled with this hodge-podge to the point where I cannot grasp it all at once, then I do a very curious thing. I try to defocus my mind, to deliberately lose it all, to melt the fragments of ideas into something akin to a hallucinatory vision... It takes a lot of nervous energy, and sounds a bit mystical, but I can explain it in no other way.<sup>1</sup>

I would argue that Stommel’s mysterious “defocusing” of the mind, and meditation practice, share a common goal, namely to loosen the attachments of the mind to its content of previously conceived ideas. A benefit for us as scientists is that this mental relaxation can create space for new ideas to emerge.

### How meditation works

When we meditate, we replace our normal, everyday mental processes with a focus on a particular mental object. Most commonly, the object of meditation is the sensations of the breath. When our everyday thinking comes up—thinking about all the things we have to do today, regret for something we didn’t do well yesterday, daydreaming about the future, judgments about whether or not we are doing a good job at meditation—we simply set those down impartially and return our attention to the object of meditation. That’s basically it. It’s very simple.

Despite its simplicity, the long-term effects of this practice are profound. When we practice setting down our habitual thought patterns, we gain some space from them. As practice continues, we gain more and more space. Eventually we begin to see just how much our habitual thought patterns shape our perception of the world we live in. Our practice translates directly into a greater degree of objectivity, a goal that is entirely congruent with the scientific value of objective and impersonal truth.

As a very simple example, shortly after I began meditating, I realized that I had been perceiving many events in my life as being “annoying”. In other words, I was assigning to external phenomenon an intrinsic quality, the quality of causing me personal annoyance. Not only was this assessment in no way objectively defensible, it also externalized control over my emotions, assigning the ability to affect my feelings to events beyond my control. Banning this word from my vocabulary was a step towards gaining a greater degree of stability and independence.

From small steps like this repeated over time, meditation eventually results in a calmer, happier, and more agile mind.

The positive effects of meditation are, I believe, particularly beneficial for scientists. Our work involves investigating the unknown, seeking answers to questions, and solving problems. A subtle effect this has on us in the long run is that it trains us to see the world in terms of questions that need answering and problems that need solving. Meditation helps us to see the world in a different, more transparent way, by peeling away the layers of our previous conditioning.

### Simple instructions

To get started with meditation, first sit comfortably. It is perfectly fine to sit in a chair, with your feet flat on the floor, or on a cushion or pillow on the floor if you can do so comfortably. You can place your hands on your thighs if you are sitting in a chair, or you can place them palm up in your lap with one hand resting in the palm of the other. Set a timer for a designated period of time. Fifteen or twenty minutes is good in the beginning.

Then, let your attention settle on the physical sensation of your breath in your abdomen, noticing the feelings of inhaling, and noticing the feelings of exhaling. There’s no need to investigate the sensations in detail. Just let your mind observe the sensations impartially, first of one breath, then the next breath, and so on. Whenever your attention wanders from your breath, as soon as you become aware that it has wandered, you simply return it to lightly observing the breath sensations happening in the moment.

The breath is chosen as a meditation object in part because it is always there. As long as you are alive, in any situation, you can always access your awareness of breath to tap into a calming experience.

It is possible to do all of one’s meditation sitting in a chair. If one is inclined to try sitting on the floor, at a certain point one might want to invest in a meditation cushion, generally known by the Japanese term “zafu”. I personally like to sit on a cushion in [{Burmese style}](#), a stable and comfortable traditional sitting posture that doesn’t require a huge amount of flexibility.

### The importance of having teachers

The simple instructions given above are enough to get started with. If you want to continue with meditation, it’s important to do it every day, or as close to every day as possible. To really have meditation make an impact in one’s life, however, its essential to find a teacher or support group.

For its entire history, meditation has been passed down directly from person to person. You learn it from someone who has learned it from someone else. It is natural to ask why it is necessary to have a teacher for a practice that is evidently so simple. While the practice is simple, its effects are profound. As concentration deepens with consistent practice, there are certain predictable landmarks that arise, as well as certain predictable internal resistances that our habitual thought patterns tend to generate. Moreover, as we gain distance from our habitual thoughts, there comes a reassessment of long-held priorities and a process of internal reorientation.

The meditation knowledge that has been passed down through the generations includes detailed support, context, and instruction in all of these factors. It is quite unreasonable to think that a person could figure out on their own the accumulated understanding of many intelligent and dedicated people working together over thousands of years.

### Resources

Nowadays there are many different kinds of meditation groups active in pretty much every city. It is highly recommended, if you want to continue, to take a weekend workshop and also to find a group that you connect with in your city to sit with from time to time. The main criterion is finding a group that you click with personally. I’ll just mention a few recommendations from my limited experience.

Probably the best place to learn meditation is from a group in the Buddhist tradition. This is going to require that the scientist develop a certain tolerance for bells, robes, and incense. Even though the practice itself is in essence an arguably scientific and secular one, there can be exterior trappings that one commonly associates with religious practice. These could be seen as a mark of authenticity. However, if this is not to your inclination then there are also plenty of secular groups teaching meditation to choose from.

There are also different types of meditation. The two main types in the Buddhist lineage are concentration meditation, also known as samatha, and insight meditation, also known as vipassana. The brief introduction above is a simplified variation of “mindfulness of breathing” meditation, also known as anapanasati, a type of concentration meditation. Another type of concentration meditation is called metta meditation, which uses phrases of goodwill toward oneself as the object. Although insight meditation is considerably more well-known in the West, I personally feel that concentration meditation is a better match for the needs of scientists, if my own experience is any guide.

If there is not a place that teaches meditation in your area, or if you would like to try meditating on retreat, look into the offerings of the three major meditation centers in the US, the [{Insight Meditation Society}](#) in Massachusetts, [{Spirit Rock}](#) in California, and [{Cloud Mountain}](#) outside of Seattle, Washington.

Another good resource is the free [{Insight Timer}](#) app. In addition to a choice of nice sounding bells to start and end your meditation periods, this app keeps track of your progress, as well as offering access to a large library of guided meditations and instructional talks.

### Conclusions

It is a unique time in human history in that the ancient technique of meditation from the East, and the similarly ancient method of logical and scientific thinking from the West, are now both in contact with each other and available to us. My personal experience, and the experience of a number of other active scientists, is that meditation practice has a huge amount to offer us both as individuals and in our work. I sincerely hope that others will benefit from our experience and join in this investigation.

This essay was written in support of the workshop [{Meditation for Scientists}](#), offered at the 2020 Ocean Sciences meeting in San Diego, together with my friend and colleague [{Stephen Griffies}](#), a longtime meditator. You can find Stephen’s presentation [\[here\]](#).

1. Stommel, H. M. (1995). Autobiography. In N. G. Hogg and R. X. Huang (Eds.). *The Collected Works of Henry M. Stommel, Volume 1*, p 1-10. Boston, MA: American Meteorological Society. ↩

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