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Commentary: Surviving scientist burnout

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Commentary

Surviving scientist burnout

CYNTHIA CUMMINGS

DETAIL FROM *THE AWAKENING* by Seward Johnson, ©1980 The Seward Johnson Atelier, Inc.

A pressing problem that greatly affects the scientific research community and needs broader discussion is the issue of burnout. Induced by unrelenting stresses associated with research and academic activities, burnout produces anxiety, fear, loss of self-esteem, and diminished functioning.

Those who experience burnout can also be discriminated against, more because of the lack of understanding than through any systemic prejudice. Yet speaking publicly about mental health issues can have a stigma attached to it. So I was grateful to read Andrea Welsh's 31 May 2017 commentary, "It's time for physicists to talk about mental health," on the PHYSICS TODAY website. My comments here are not a criticism of the system but rather a request for attention and understanding.

The highly competitive atmosphere in which scientists work leads to an unrelenting daily race to do more and to do it better. That race sets many up for burnout. Sometimes scientists reach their goals, and those successes fuel their recovery from stress. At other times, because of a lack of time and money or because of unrealistic expectations—theirs or others'—they do not meet their goals. Those cases, lacking the positive feedback of success, can, over time, sap their drive to continue.

Scientists' jobs require that they do continue—to publish, teach, seek research funding, and participate in meetings around the world—when what they really need is time to stop and recharge. They realize that their absence from any of their career activities could lead to the loss of their reputation and standing in the community. Fear and anxiety begin to dominate their actions and thoughts and may increase to unbearable levels.

When scientists reach the end of their stress tolerance, even the minimal performance required for a small lecture or a local meeting can become a nightmare. They may feel unable to explain even a simple formula to a handful of students; struggle to find the right words; develop anxiety symptoms such as trembling, feeling faint, or experiencing fear and shame; or find that body and mind are not working together. By that time, the decrease in both happiness and the ability to function is well under way: Desperation leads to depression and isolation.

If you are an individual in the throes of burnout, you cannot believe it has happened to you, the superman or superwoman who was traveling the world giving plenary lectures and leading committees and high-level meetings. You stubbornly continue to try to function,

but the harder you try, the lower you fall. As with many personal issues, you have to reach a bottom point before recovery can begin. It is a long, painful journey just to admit you have a problem, but from that point you can begin to rebuild. The love for physics and research slowly comes back, and you are able to balance your career activities with the needs of your mind and body. While you were climbing back up, however, the rest of the world was going on without you.

As you recover, it may be necessary to take a backstage role for a time and leave to others the leadership and public roles that tend to carry more stress. Yet if you cannot be present at meetings and be visible through talks and seminars, then it appears you are not fulfilling the requirements of the modern professional researcher, who is more and more a manager and less and less a scientist. Colleagues may have pity on you and try to make room for you, perhaps temporarily, perhaps at a level that does not reflect your high academic value, but such adjustments are all the system currently allows. You have no real future and no real prospects.

I have witnessed some truly talented people run into this nightmare and, even after basically recovering, "disappear" scientifically. They have minimized their workload just to a survival level, but the system has no provision for a return to their full career. The burnout may leave them with side effects that hopefully will diminish with time—for example, the inability to stand in front of an audience, sit in a closed room for hours discussing a project, travel alone, or take on greater responsibilities.

I don't suggest that we pity those who are experiencing burnout or that we free them from all responsibility while they recover. Instead, I am asking that accommodation be made to allow a person with burnout to continue to have a respected position where they can fulfill academic duties according to their current capabilities. For example, a person who is so anxious as to be unable to speak in front of an audience could still be quite capable of doing the behind-the-scenes research and writing to prepare the lecture and then let someone else deliver it. The person could work remotely or take on additional tasks that do not involve the highest job stressors, tasks such as organizing seminars, correcting student exercises, and doing background research for presentations.

My hope is that the system, insensitive and competitive as it can be, may still afford dignity and respect to colleagues who fall into the black hole of burnout. One day, without even realizing it, any of us could take that fall. My experience is that with personal, professional, and practical support, recovery is just around the corner for people experiencing burnout.

An even more powerful way, perhaps the best way, to address burnout is prevention. Lightening the load by reducing the most stress-inducing commitments before reaching a breaking point does not indicate a lack of character, but rather a healthy intelligence and a desire to be efficient and productive for the long term.

People often associate physicists with the stereotype of mad genius. Many TV series make fun of the intelligence and eccentricities of physicists, but psychological fragility is a true nightmare. I would like to see the scientific community combine its intelligence and unite beyond competition to defeat burnout, for ourselves and for our colleagues. Then perhaps we can also find amusement in society's stereotypes of us.

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LETTERS

Climate change scenarios and risks

I enjoyed reading Heather Graven's article "The carbon cycle in a changing climate" (PHYSICS TODAY, November 2016, page 48) and the other articles that month on modeling different aspects of climate change. After reading those and other articles on the subject, I have an uneasy feeling that people are missing the point when it comes to dealing with climate change.

The optimal strategy almost certainly depends far more on the very small probability of extreme changes in climate than on the most likely changes. People seem to focus only on modeling the most likely changes in climate, and maybe the one-standard-deviation error bars, which are likely to be almost irrelevant in choosing the best strategy. The general consensus of climate models, such as those discussed by Graven, is for average global temperatures to rise by a few degrees Celsius over the next several decades, which will have serious effects on agriculture, water resources, coastal flooding, species diversity, and human migration. People argue over justification of spending today to avoid the costs of those effects over the next several decades.

However, if one assumes that climate changes are 100% certain to resemble the shorter-term model consensus, then the best strategy for minimizing net costs might be to spend very little now and instead wait 20 or 30 years. By that time some future technology, perhaps involving intelligent robots, may be able to accomplish anything we want, virtually for free, to reverse whatever climate change has meanwhile occurred, even if much more drastic measures are needed then than would be needed now. Freeman Dyson makes a similar point about discounting future costs because of advancing technology.[1]

The problem with the wait-and-see approach is that we cannot be 100% certain that something like these consensus climate models is correct. In particular, we cannot exclude the possibility that a runaway greenhouse effect will become unstoppable in less than 20 or 30 years and eventually leave Earth uninhabitable. After all, it did happen on Venus, which started out similar to Earth but with about twice the solar forcing. If that is a real—even if unlikely—possibility, then the optimal strategy might be completely different: Spend a lot of money now to try to prevent the runaway greenhouse effect.

Since our optimal strategy depends very much on unlikely, but still possible extreme scenarios, it seems to me we should be devoting a significant portion of our research budget to modeling how those scenarios might occur, rather