credit nuclear deterrence exclusively, as is often done, for the absence of direct war between the leading military powers since World War II. Many other changes in the international system have also contributed, including the formation of supranational organizations such as the European Union and the United Nations, an increase in the number of democracies, and increased global trade and international scientific collaboration.

In any case, nuclear deterrence risks global catastrophe. Including the Cold War confrontations over West Berlin, the Cuban missile crisis, and multiple close calls from launch-on-warning postures, humanity has escaped a nuclear Armageddon by many strokes of luck. Physicists, familiar with instabilities in physical systems, should be explaining the instabilities of the current nuclear postures and how to reduce them—especially incentives for first use.

In the early years of the nuclear age, eminent physicists working on nuclear weapons in the national labs struggled over the ethics of their work. Hans Bethe once called the hydrogen bomb "the greatest menace to civilization."[5] He later explained his decision to work on it nonetheless: "If I didn't work on the bomb somebody else would—and I had the thought if I were around Los Alamos I might still be a force for disarmament. So I agreed to join in developing the H-bomb. It seemed quite logical. But sometimes I wish I were more consistent an idealist."[6]

Such self-questioning within the physics community, including within nuclear weapons laboratories, currently seems muted. It is time for the renewal of vigorous discussions of how to reduce the dangers from nuclear weapons and of the consequences of research on nuclear weapons. To suggest one route for participation, we invite physical scientists to join the Physicists Coalition for Nuclear Threat Reduction (https://physicistscoalition.org), which the two of us recently cofounded with others. Physicists must act now, for the sake of everyone.

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Revisiting science and colonialism

Being a history buff, I have read all sorts of "justifications" for colonialism, including Niall Ferguson's book *Empire*, in which he claims British imperialism modernized the world,[1] and Bruce Gilley's controversial article "The case for colonialism," in which he presents a full-throated justification for the practice.[2] But the commentary by Suman Seth (Physics Today, December 2022, page 10) is the first piece that I've read that seems to glorify colonialism by linking it to scientific advances.

Seth states, "It is hard to imagine what much of modern science would have looked like without colonialism." Such a statement should be accompanied by a mention of the fact that under colonialism hundreds of millions of people lost their lives, many colonies were looted, and slavery flourished—the consequences of which we still live with today.

Are we supposed to look more fondly on colonialism because some scientific advances may have been delayed a bit in its absence? Before considering where science would be without colonialism, one should consider colonialism's devastating impacts. Colonialism killed more than 50 million native people in the

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Americas.[3] King Leopold II's rule over the Congo Free State is associated with the deaths of 5 million to 10 million people, though it was possibly many more.[4] Under British rule, India experienced 165 million excess deaths between 1880 and 1920.[5] An estimated 125 000 to 400 000 civilians died in the First Indochina War, which was fought for liberation from France. Algerian sources say 1.5 million lives were lost in that country's war of liberation against France. And such statistics do not even reflect the cultural genocide that occurred.

It is shameful to imply colonialism was justified for any reason—and that includes its connection to scientific advances.

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In his December 2022 commentary (page 10), Suman Seth reflects on the historical interconnection between scientific development and colonialism. A fascinating document whose mere existence illuminates that relationship in the 19th-century British empire is *A Manual of Scientific Enquiry; Prepared for the Use of Her Majesty's Navy: and Adapted for Travellers in General* (1849). The book was edited by astronomer John Herschel and can now be found online. It includes sections by such notable scientists as Charles Darwin, who writes on geology, and George Airy, who discusses astronomy. Among the other topics it covers are ethnology, statistics, and magnetism. Armed with its guidance, the officers of the empire could make themselves scientifically useful while ranging the globe.

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► **Seth replies:** I am afraid that Muhammad Sahimi has rather misconstrued the point of my commentary. My aim was not to defend, let alone "glorify," the evils of colonialism by linking it with science, but rather to better characterize the nature of modern scientific work. Despite decades of scholarship, many people persist in seeing science—or, at least, "good" science—as a largely apolitical and decontextualized endeavor. Making obvious the fact that modern science could not have existed without connections to multiple devastating colonial projects and that those colonial projects often rested on scientific advancements seemed to be a straightforward way to refute that belief.

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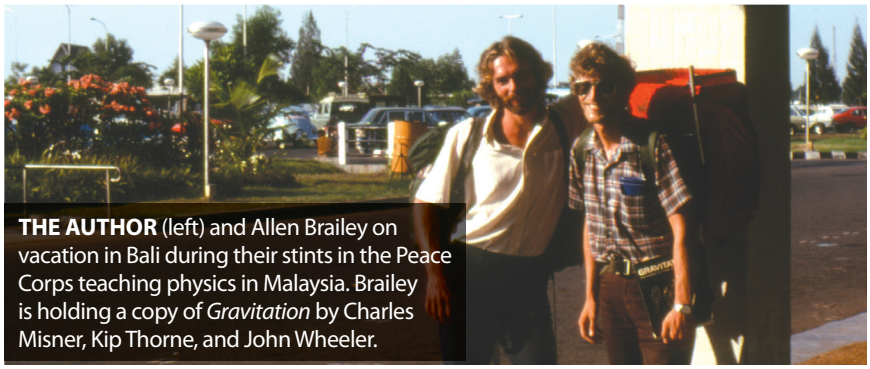
Malaysian physics in the 1970s



THE AUTHOR (left) and Allen Brailey on vacation in Bali during their stints in the Peace Corps teaching physics in Malaysia. Brailey is holding a copy of *Gravitation* by Charles Misner, Kip Thorne, and John Wheeler.

It was wonderful to see an article about physics in Malaysia in the February issue of Physics Today (page 32). I taught physics at the Universiti Kebangsaan Malaysia (UKM), the National University of Malaysia, from 1975 to 1978 as a Peace Corps volunteer with a master's degree. It was one of the best experiences of my life.

I had many great colleagues in the UKM physics department. Professors Yatim and Lim were particularly memorable. I wish I had a photo of the group like the one of the University of Malaya physics department published in the February feature.

During my time at UKM, I was the first to obtain a grant for a telescope at the school. It was installed on the top of the science building, and many students enjoyed superb views of the Moon, which plays an important role in Islam. I also established an astronomy *istilah* (glossary) by using an algorithm to translate technical terms from English into Malay, which I learned during Peace Corps training in Kuantan, on the South China Sea. I also taught beginning-level astronomy classes in the language. It was a great experience.

For the more advanced courses—nuclear physics and graduate-level electricity and magnetism—my students knew English much better than I knew Malay, which was helpful. I must say that the students in those courses were fantastic: Each of them always turned the homework in on time and had excellent handwriting. They spoiled me into imagining that being a professor in the US would be similarly easy!

In one fun anecdote from my time teaching at Reed College, a colleague of mine, David Griffiths, could hardly believe that I taught electricity and magnetism—out of John David Jackson's *Classical Electrodynamics*, no less—in Malaysia and in Malay. Who could blame him? But David, himself the author of a popular undergraduate textbook on the subject, was convinced when I showed him my lecture notes.

I am eternally thankful to the US Peace Corps and UKM for three spectacular years in a great part of the world.

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Correction

April 2023, page 49—The review incorrectly characterized Arnold Sommerfeld as an experimental physicist. He was primarily a theorist. PT