report on page 162, sanctions imposed on Moscow in response to last month's annexation of the Crimean Peninsula are threatening to affect scientific collaborations. Should the crisis continue to escalate, scientific relations between Russia and the West might suffer in earnest — at least for a while.

This would be unfortunate and almost certainly counter-productive. Moscow's violation of international law cannot be tolerated and Putin must know that there will be serious consequences for his attempt to grasp territory that belongs to another country, no matter what historic and cultural ties exist between the two nations. But science and education — spheres with a unique potential to build trust between nations — should not be used as pawns in the current conflict.

A move by NASA to suspend official contacts with Russian space entities (with the exception of activities involving the International Space Station), for instance, was premature and should be revised. The United States and Russia have collaborated in space for 40 years. Their cooperation survived the Soviet invasion of Afghanistan in 1979, when almost all other official ties between the cold war superpowers had been cut.

When the Soviet Union began to fall apart ten years later, Western support of science in the region effectively kept many Soviet nuclear experts from selling their skills to the highest bidder. And US space activities continue to depend to no small extent on Russian launch vehicles and know-how.

This long and fruitful history of scientific cooperation has proved a solid base for Western relations with Russia, and there can be no doubt that international science has benefited from research carried out in labs from Vladivostok to St Petersburg and Kiev. The political success of scientific and academic exchange programmes launched during and after the cold war — including the North Atlantic Treaty Organization's small but perfectly formed Science for Peace and Security Programme, which shut down its Russian operations last week — goes to show that civilian science is a veritable peacekeeping activity. Given that, it seems absurd to halt collaborations when the political weather turns bad.

Output of Russian science declined substantially after 1990 — Ukrainian science even more so — but expatriate mathematicians, chemists and physicists have brought many skills and fresh ideas to Western labs. The Crimea crisis, for all the concerns it is raising, is no excuse for ending this successful partnership.

"The Crimea crisis, for all the concerns it is raising, is no excuse for ending a successful partnership."

In fact, it could become a reason for Western universities, scholars and think tanks to refocus on a part of the world whose social and political dynamics they have neglected as their interest has shifted to regions such as China and the Arab world. People in the West have been surprised by what is happening in Crimea in part because they know so little about the region and its history. And many Western observers are stunned by Putin's resolute pursuit of power, and the level of support that it receives at home, because even in the scholarly world interest in Russian affairs has been low for years.

Individual scientists may have strong feelings about the independence of Ukraine and Crimea, and many will be disturbed by the nationalist chauvinism that is palpable in some Russian and Ukrainian circles. Some may therefore choose not to attend conferences and meetings in Russia as long as the crisis is raging. But funders and science policy-makers should take a calmer and more strategic view. It would not help the West, Crimea or Ukraine if Russia's current efforts to strengthen and reorganize its struggling science and higher-education systems were to fail. On the contrary: a society that cannot afford to give its best minds the opportunity to pursue science in a free intellectual environment will be more prone to resort to the nationalistic rhetoric and resentment that will fuel conflict — and not only in Ukraine. As in any crisis, the worst thing one can do is to stop talking. ■

Copper rewired

Two Nature *papers signal new roles for this ancient metal in catalysis and cancer therapy.*

A bizarre 2009 promotional film from the European Copper Institute in Brussels asks viewers to imagine life without its favourite metal, without actually showing how such a life would be any different. Copper probably does not need much promotion anyway. Ever since the first metal workers of antiquity dug the element from a Cyprus hillside and fashioned it into tools, copper has been in high demand. So high, in fact, that researchers in February raised the prospect that international copper production could peak within a few decades. (The original Cypriot copper mine lives on in the chemical symbol Cu, drawn from the Latin name for the island's metal.)

Nature this week would certainly be poorer without copper. The metal is at the heart of two discoveries reported on our website.

The first describes improvements to the intrinsic catalytic properties of copper that could streamline ethanol production (C. W. Li *et al. Nature* http://dx.doi.org/10.1038/nature13249; 2014). Just as important is the starting material of the chemical reaction that the copper helps along — the greenhouse gas carbon dioxide. In theory, better copper catalysts could offer an efficient method to convert carbon dioxide to liquid, carbon-based fuels.

Imagine life with such a better copper catalyst. Intermittent renewable energy such as wind and solar sources could be used to drive the reaction, and would address two major energy and environmental problems at a stroke — what to do with all the carbon dioxide we generate, and how to store and transport renewable energy. A News & Views article lays out the roadmap for making it happen (A. M. Appel *Nature* http://dx.doi.org/10.1038/nature13226; 2014).

The research demonstrates that all is not lost when it comes to the fight against climate change. More research will produce better and more efficient technology, yielding some new and some improved versions of what we already have.

The traditional copper-catalysed conversion of carbon dioxide to liquid fuel proceeds through an intermediate of carbon monoxide. Many catalysts can perform the first step, but only copper can mix the carbon monoxide with water to produce the fuel. Yet its promise is largely theoretical: the efficiency and selectivity of the reaction until now have been too low for practical use.

In the latest study, chemists at Stanford University in California show that the catalytic properties of copper can be boosted by starting with copper oxide, which is then reduced back to the base metal. Their enhanced catalyst produces more ethanol than a conventional copper catalyst. They suggest that the difference might be down to tiny cracks introduced to the metal, which give the catalyst more space to work.

In the second study, scientists describe experiments that show copper is required for tumour growth and signalling in some cancers, specifically those with a common mutation in the oncogene *BRAF* (D. C. Brady *et al. Nature* http://dx.doi.org/10.1038/nature13180; 2014). Treatments used to mop up excess copper in the body, already used against copper-accumulation disorders such as Wilson's disease, seem to block the growth of these cancer cells too. The experiments were done in mice and cultured human cells, but suggest that broader use of 'copper chelators' against such cancers could be useful. With apologies to the European Copper Institute, life without (as much) copper for some people could be better, not worse. ■

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