VECTOR RESULTANTS

Unit 3 Dr. John P. Cise, Professor of Physics, Austin Com. College, Austin, Texas, USA jpcise@austincc.edu & New York Times April 26, 2018 by Henry Fountain

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The rocks here in Oman are special, this scientist says.

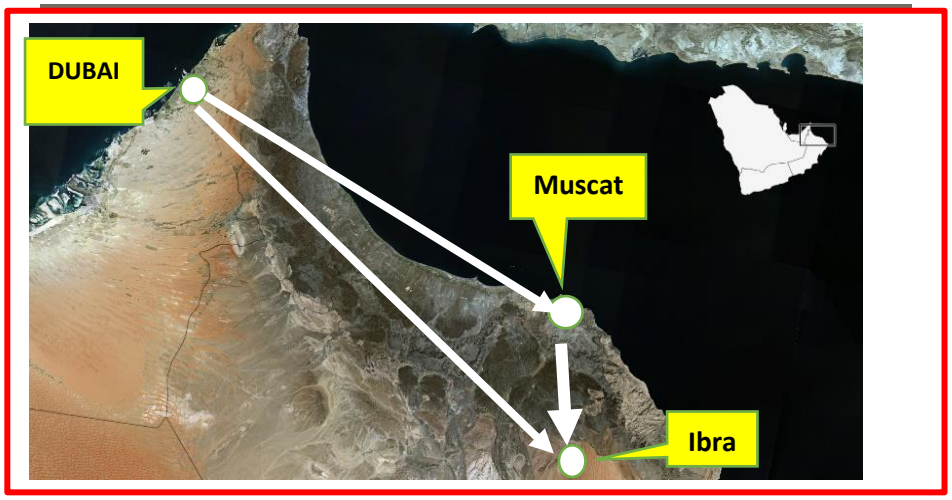
Peter B. Kelemen, a Columbia University geologist, near Muscat, Oman. Henry Fountain, a New York Times reporter covering climate science, went to Oman to learn more about the science. Vincent Fournier, a photographer, captured the landscape.
IBRA, Oman — In the arid vastness of this corner of the Arabian Peninsula, out where goats and the occasional camel roam, rocks form the backdrop practically every way you look. But the stark outcrops and craggy ridges are more than just scenery. **Some of these rocks are hard at work, naturally reacting with carbon dioxide from the atmosphere and turning it into stone. Veins of white carbonate minerals run through slabs of dark rock like fat marbling a steak.**

INTRODUCTION: Goal here is to find resultant from Dubai to Ibra. Dubai to Muscat is 420 km. at 45° below east(positive X direction). Ibra is due south of Muscat 160 km. See sketch below.

QUESTION: Find resultant displacement from Dubai to Ibra?

ANSWER: Resultant displacement = ~ 537 km. at 53.2° below east (X direction)

Carbonate veins form when water containing dissolved carbon dioxide flows through these rocks.
Even pooled spring water that has bubbled up through the rocks reacts with CO_2 to produce an ice-like crust of carbonate that, if broken, re-forms within days.



When the water comes back into contact with air, a thin layer of carbonate hardens across its surface.
Scientists say that if this natural process, called **carbon mineralization**, could be harnessed, accelerated and applied inexpensively on a huge scale — admittedly some very big "ifs" — it **could help fight climate change. Rocks could remove some of the billions of tons of heat-trapping carbon dioxide that humans have pumped into the air since the beginning of the Industrial Age.**