

3.032 Mechanical Behavior of Materials

Fall 2007

Edge dislocation

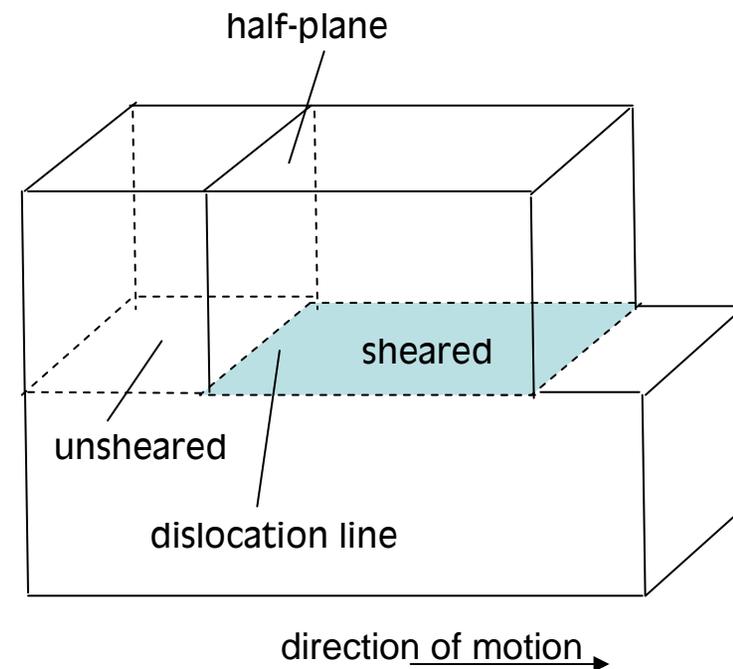
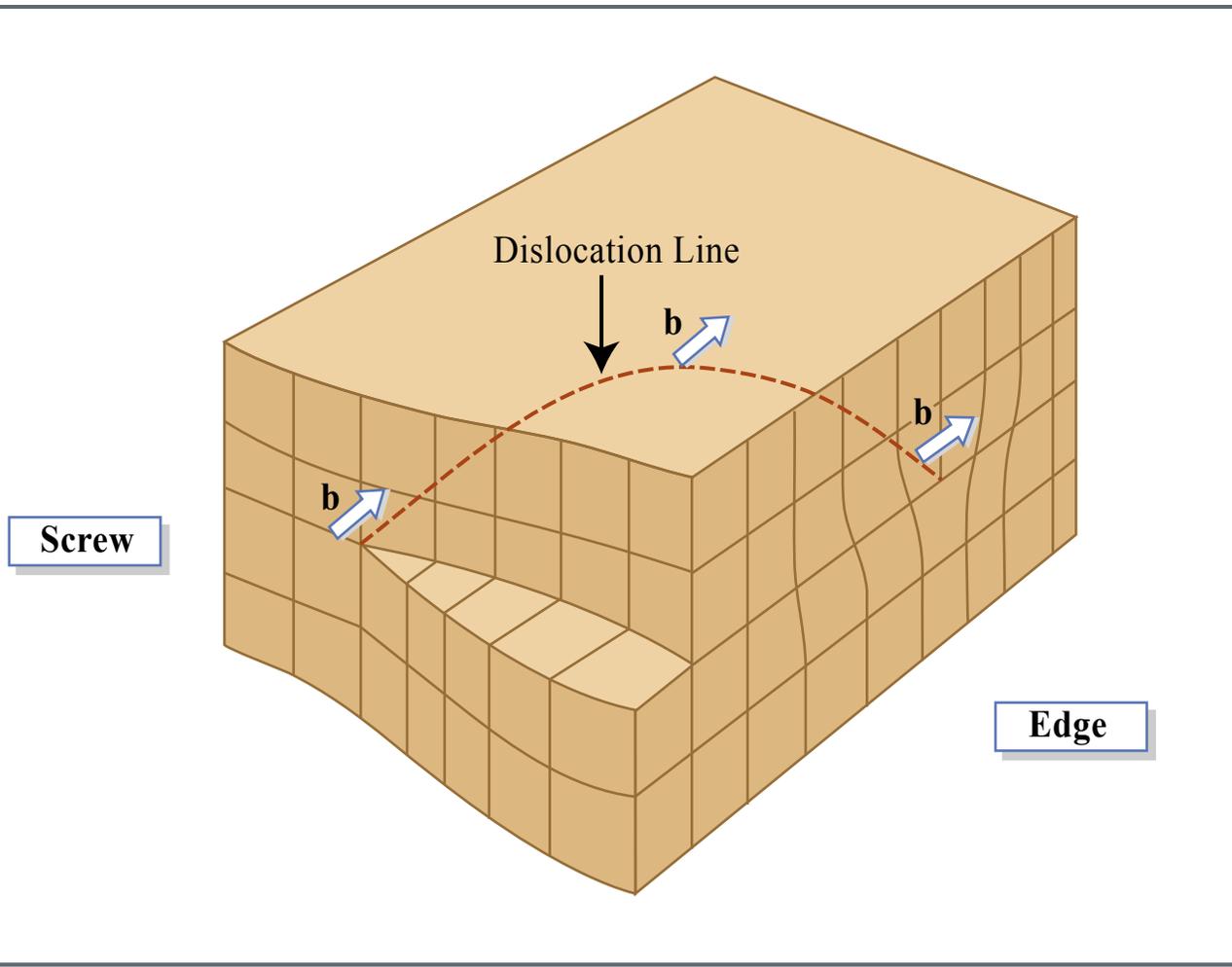


Figure by MIT OpenCourseWare.

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Screw dislocation

Literally looks like the threads of a screw
or a spiral parking garage.

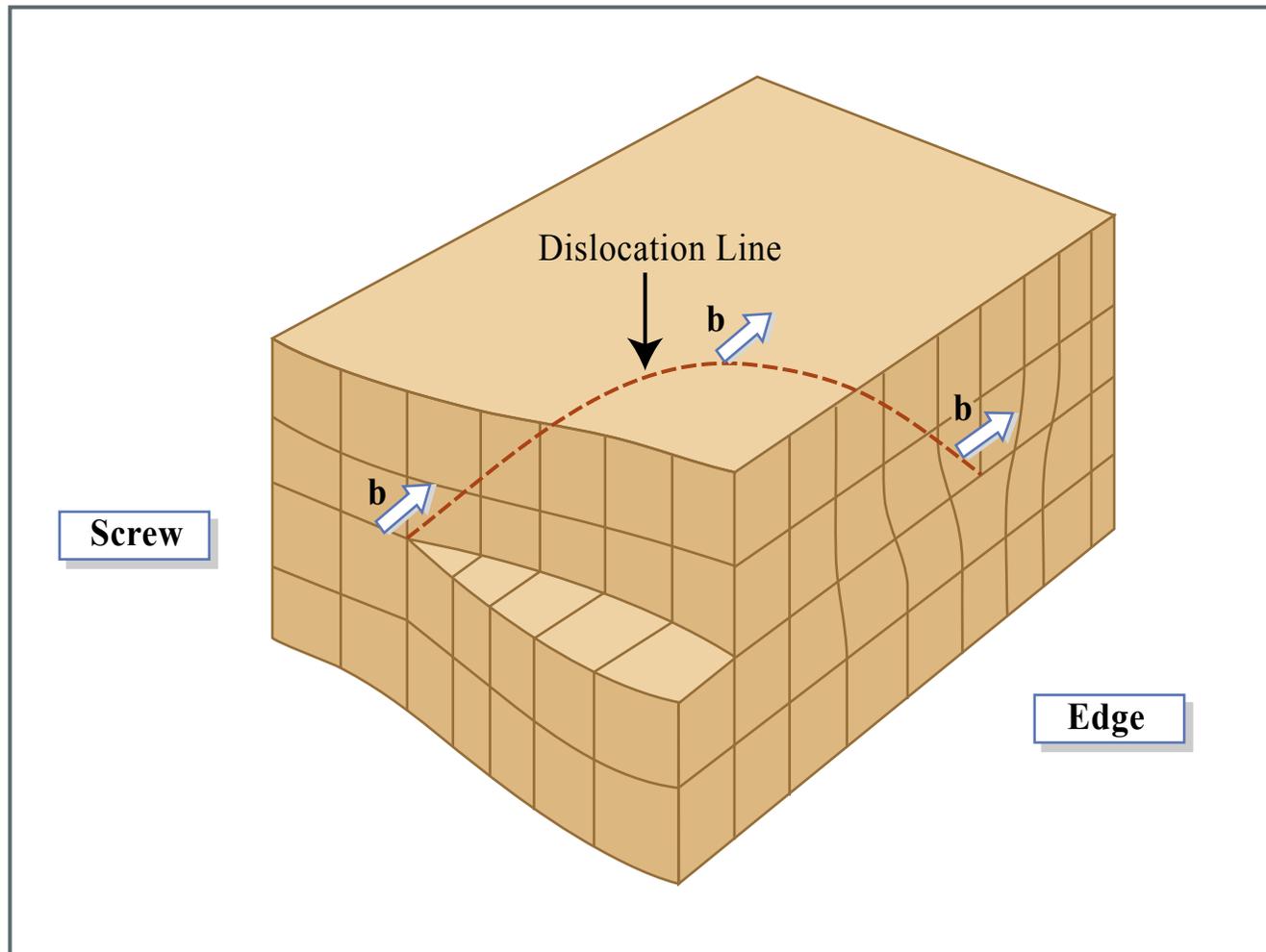


Figure by MIT OpenCourseWare.

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How do we view dislocations?

Etch pitting: Add corrosive chemicals that preferentially target the defect region

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in Hull, Derek, and Bacon, D. J. *Introduction to Dislocations*. Boston, MA: Butterworth-Heinemann, 2001.

Other approaches: Silver decoration (ionic crystals), transmission electron microscopy, X-ray diffraction

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How do we view dislocations?

2. Dislocation decoration:

Heat treat to move impurity atoms to defect sites, then etch to reveal location of impurities (eg, Ag⁺).

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in Hull, Derek, and Bacon, D. J. *Introduction to Dislocations*. Boston, MA: Butterworth-Heinemann, 2001.

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3. Transmission electron microscopy diffraction

4. X-ray diffraction

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in Hull, Derek, and Bacon, D. J. *Introduction to Dislocations*. Boston, MA: Butterworth-Heinemann, 2001.

5. Field ion microscopy diffraction