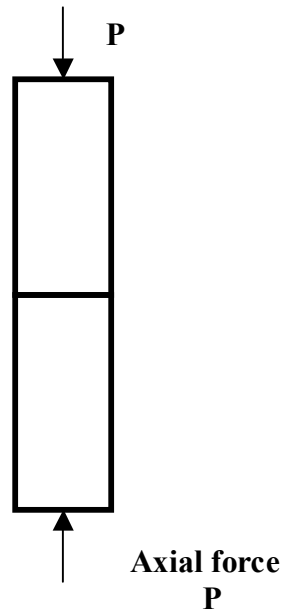**2.800 Tribology**
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Homework Exercise (for discussion in class in about two weeks)

1. Figure 1.7[1] shows an undulated surface that is designed to reduce friction by eliminating wear particles from the sliding interface. The interface is subjected to normal force N. The sliding speed is so low that the interfacial temperature rise is negligible relative to the melting point of the material. We are planning to use metals for the sliders.
   a. Determine the optimum dimensions of the undulated topography.
   b. Discuss the consequence of deviating from the optimum geometry.

2. We are interested in bonding two rods together axially as shown below. We must be sure that the real area of contact is the same as the apparent area of contact. Suggest a means of achieving this goal.

P

**Axial force
P**

3. Door hinges of naval fighter airplanes based on aircraft careers can malfunction due to high friction, which may lead to eventual seizure. Discuss possible causes for the friction and seizure problem. Develop a design that can eliminate the problem. Define functional requirements for the door hinge before designing the door hinge.

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[1] Tribophysics and Design of Tribological Systems (Manuscript)