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Henry Petroski: Success through Failure

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INTRODUCTION

Desire, not necessity, is the mother of invention. New things and the ideas for things come from our dissatisfaction with what there is and from the want of a satisfactory thing for doing what we want done. More precisely, the development of new artifacts and new technologies follows from the failure of existing ones to perform as promised or as well as can be hoped for or imagined. Frustration and disappointment associated with the use of a tool or the performance of a system puts a challenge on the table: Improve the thing. Sometimes, as when a part breaks in two, the focal point for the improvement is obvious. Other times, such as when a complex system runs disappointingly slowly, the way to speed it up may be far from clear. In all cases, however, the beginnings of a solution lay in isolating the cause of the failure and in focusing on how to avoid, obviate, remove, or circumvent it. Inventors, engineers, designers, and common users take up such problems all the time.

The earliest useful things were, of course, those found in nature. Not surprisingly, these same things became the earliest tools. Thus, rocks came to be used as hammers. Whether a particular rock makes a good hammer depends on its size and shape and on its hardness and toughness relative to the object being hammered. Rock types that failed to accomplish desired ends became known as poor hammers and so came to be

