HARVEY MUDD
COLLEGE

Department of Engineering
Seminar Program
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Galileo McAlister, 4:10pm

"Slum Housing – Building a Better Shack" by
John Livingston M.S.E.E., P.E.
Former V.P. of Research, Development and Engineering at MiniMed (now Medtronic MiniMed).

Roughly one billion people live in dilapidated shacks in urban slums, primarily in developing countries. For the most part, these dwellings, made of randomly acquired materials, are little protection from heat and cold and are difficult to keep dry, sanitary and vermin free. Because they are generally built from highly flammable materials, and because they are so close together, fire danger is extreme. Once a fire starts, usually from a candle or a stove, it spreads quickly through hundreds of these shacks, resulting in periodic, and tragic, loss of life. The challenge is to design an improved shelter that is inexpensive, structurally sound, secure, fire resistant, waterproof, insulated, and vermin and insect resistant. Ideally, the shelter should occupy the same space as the existing slum dwelling (usually less than 200 square feet), and take no more than a day to construct. Typically, construction will be done with fewer than five unskilled workers with simple hand tools, no electrical power, and no poured concrete slab. From a design standpoint, the constraints are daunting. The construction time constraint is included because in some countries, squatters must be able to move into the new shelter on the same land as their existing shelter within one daylight period to avoid eviction. The long-range goal is to develop inexpensive construction materials, designs and techniques to enable local construction enterprises to quickly and inexpensively build durable homes to replace individual shacks in urban slums, or at least be a source for the design and materials to do so.

Various approaches to meet the need for such housing will be described, including prototype structures that have been built in a South African slum by Tapestry Homes, a Christian non-profit organization based in Southern California.

The importance of inputs from the local community, governmental agencies, financial institutions, social service organizations and aid organizations will also be discussed. These considerations often place even more constraints on the design of the housing.

Bio:

John Livingston spent 16 years with MiniMed, a startup manufacturer of medical electronic devices to serve people with diabetes. He was the Vice President of Research, Development and Engineering for the company, which was subsequently acquired by Medtronic. His career at MiniMed also included activities and responsibility for Manufacturing, Regulatory Affairs, Legal Affairs, Grants Management, and University Relations. Prior to MiniMed, Mr. Livingston held positions in Research and

Development at IMED, Cordis, and General Dynamics. He is a USAF veteran, and earned a B.S. in Engineering and Applied Science from Yale, an M.S.E.E. from Stanford, and a J.M. from Stanford School of Law. He is a registered Professional Engineer and a Patent Agent and has more than 20 patents relating to medical devices. He serves on the Board of Directors of Tandem Diabetes Care, a startup company in San Diego, on the Advisory Board for Jio Health, a private company in Irvine, and on the Clinic Advisory Committee at Harvey Mudd College. He is involved with a number of Christian charitable organizations, including the Barnabas Group, MAP International, Threads Africa, and Tapestry Homes.