

Gasifying Coal in High-Velocity Fluidized Beds, Arthur M. Squires,
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Two distinct arts of fluidization arose independently from (1) Winkler's 1922 invention for gasifying crushed coal fluidized at about 15 ft/sec, and from (2) Lewis and Gilliland's discovery in 1938 that a bed of a fine catalyst remained "stationary" when fluidized at 1 ft/sec even though this was beyond the Stokes-Law settling velocity for the powder.

(1) Development of the first art led to processes treating crushed solids of natural origin; also, to agglomerating beds of two kinds: (a) accreting beds that produce dense beads, and (b) the Godel ash-agglomerating bed.

(2) Development of the second art led to higher velocities in both regenerator and cracking zone of the fluid cracker. Recently Lurgi has shown that a "fast fluidized bed" of a fine powder recirculating at 10 to 15 ft/sec displays good thermal communication between an exothermic zone near the bottom of a column and endothermicity elsewhere in the column.

Experiments and concepts for gasifying coal in fluidized beds will be reviewed in light of the two fluidized-bed arts. It appears that high-velocity beds will have many advantages for producing low-Btu gas to serve gas turbines in combined-cycle power systems.