

Teaching Engineers for Standardizing



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My background

- **Multidisciplinary background**
 - Study history of technology and business
 - Study and teach communication and organization studies at MIT's Sloan School of Management
- Co-authoring (with Craig Murphy) history of industrial standardization
- Teach at MIT, a great institution for educating engineers

Agenda

- Educating engineers for standardizing
 - Learnings from our research
 - Strong diplomatic & communication skills among great standardizing leaders
 - Importance of negotiating and communicating in standardizing process
 - Thoughts on teaching engineers based on these lessons

Great standardizing leaders as diplomats and communicators

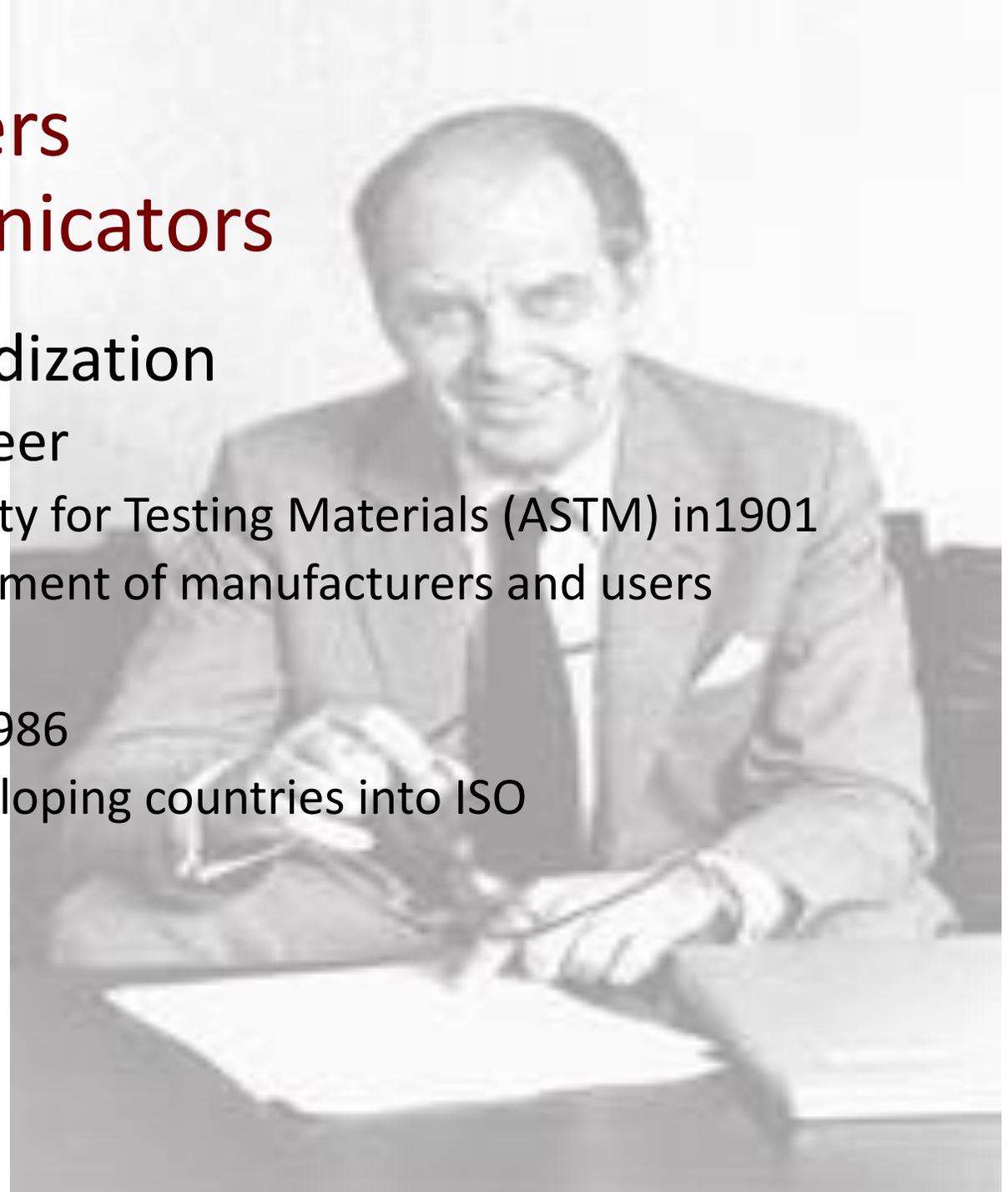
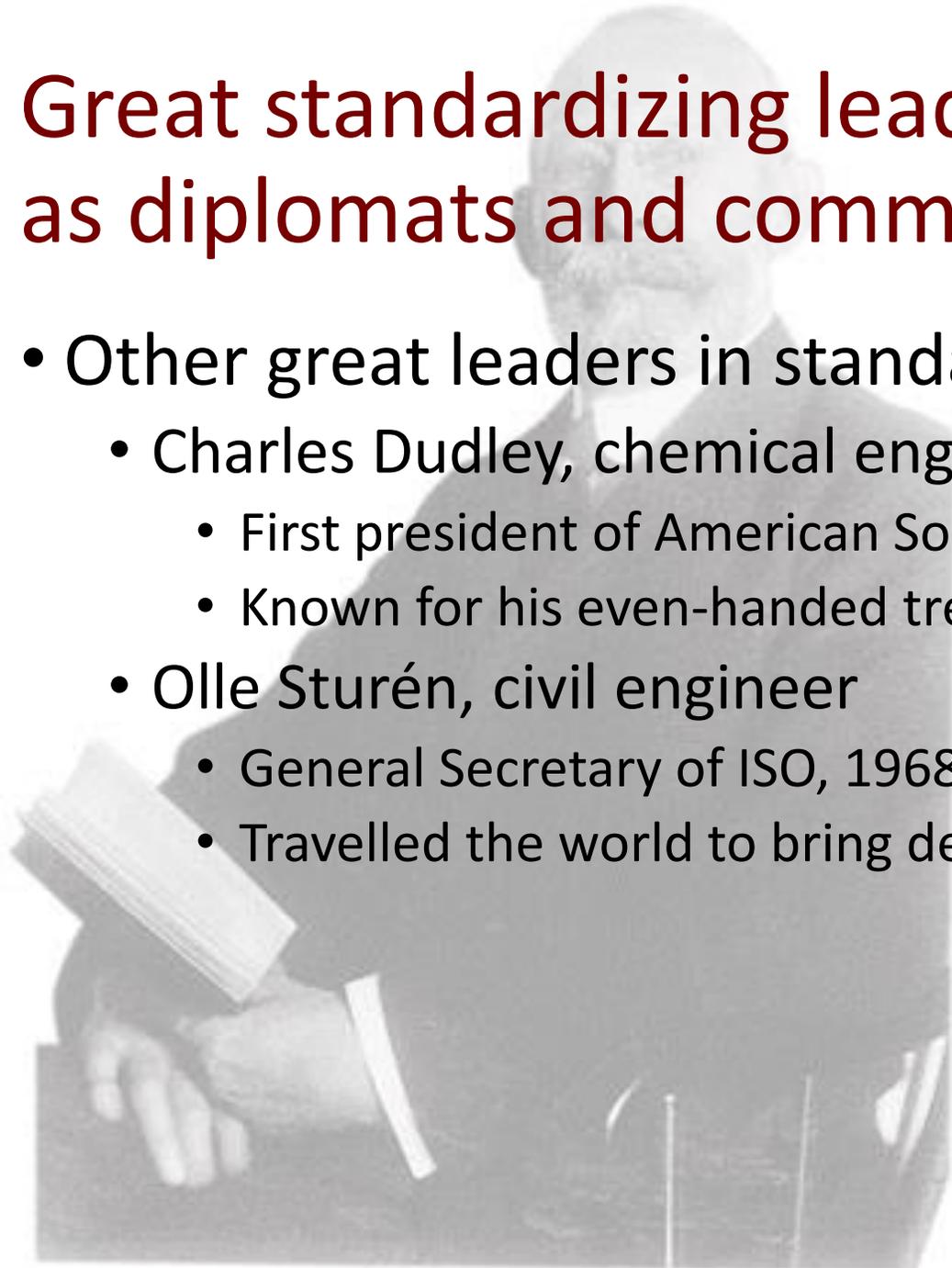
- Charles le Maistre, electrical engineer
 - Secretary of British national standardizing body from 1901
 - General Sec'y of IEC (International Electrotechnical Commission) from 1906
 - Helped establish ISO (International Organization for Standardization) in 1946
 - Proselytizer of standards around the world for 50 years
 - Known for his diplomacy, tact, & ability to settle disputes

Great standardizing leaders as diplomats and communicators

- Charles le Maistre's techniques (according to A. Lange):
 - His "warmly personal" tone in extensive correspondence with engineers and standardizers throughout the world
 - His ability to intervene in meetings to "so illumine the issues that the solution became clear to each side and they would be left with the impression that they had found it themselves"
 - To put his "persuasive powers" to work in convincing broader audiences of the importance of standardization"

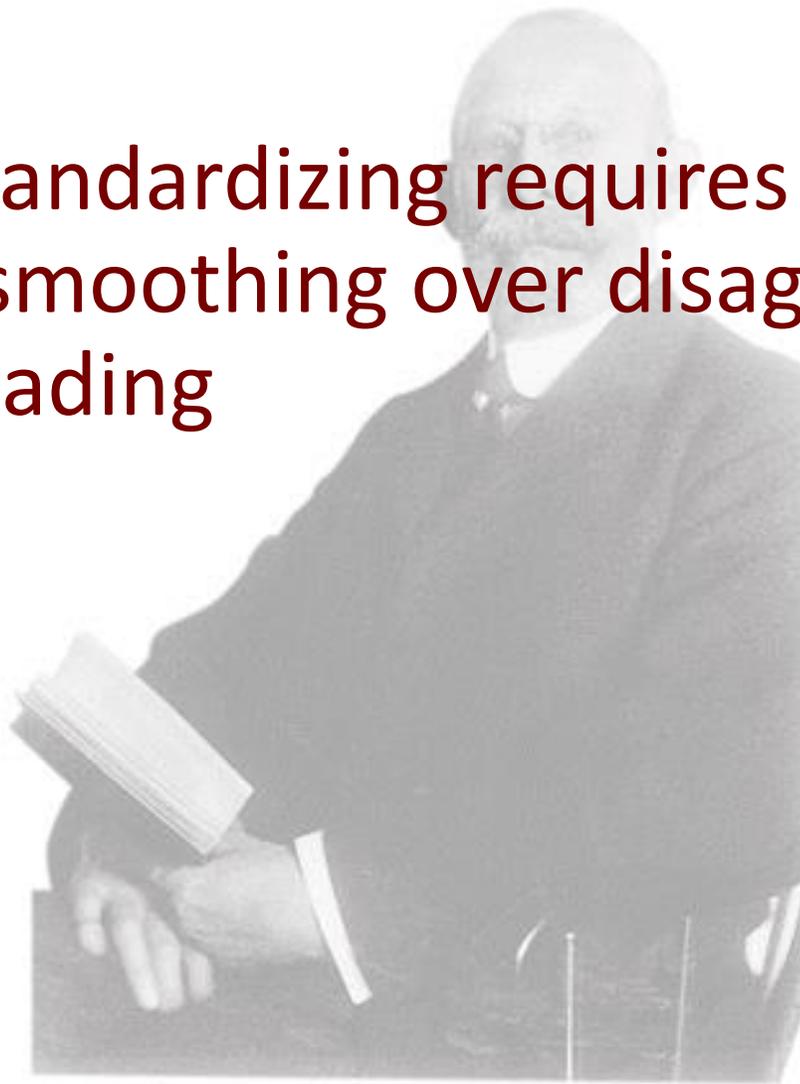
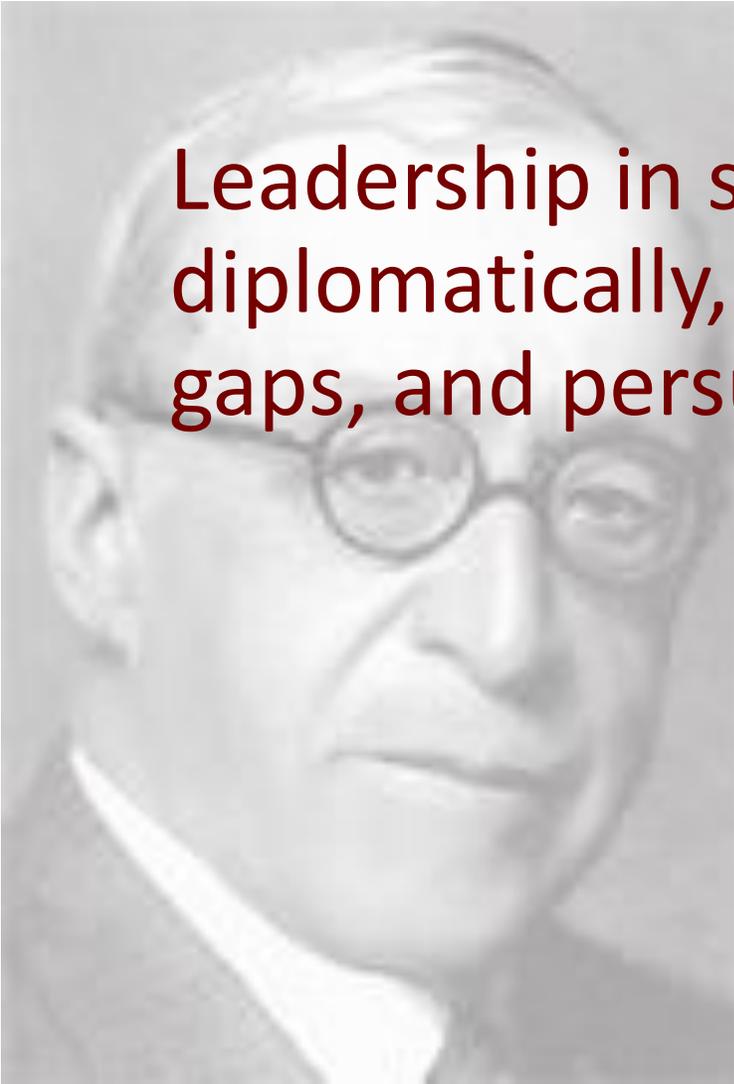
Great standardizing leaders as diplomats and communicators

- Other great leaders in standardization
 - Charles Dudley, chemical engineer
 - First president of American Society for Testing Materials (ASTM) in 1901
 - Known for his even-handed treatment of manufacturers and users
 - Olle Sturén, civil engineer
 - General Secretary of ISO, 1968-1986
 - Travelled the world to bring developing countries into ISO



Lesson

Leadership in standardizing requires communicating diplomatically, smoothing over disagreements, bridging gaps, and persuading



Effective members of standards committees as communicators & negotiators

- In technical committee meetings, gaining consensus requires
 - Communicating points of view
 - Persuading others towards a point of view
 - Working out creative compromises with others
 - Knowing when to compromise or concede

Either only nice people work in standardization, or standardization makes you nice.

-- Nalle Sturén (married to Olle Sturén)

The delegates must know when to hold on to a principle and when to give up on principles that are held for convenience. The organizations that support the delegates—from single-person companies to the largest multinationals—must know or learn when to fight and when to withdraw. Certain principles cannot or should not be compromised, but, all too often, a position is defended because it is easier to be dogmatic than to understand what is really going on.

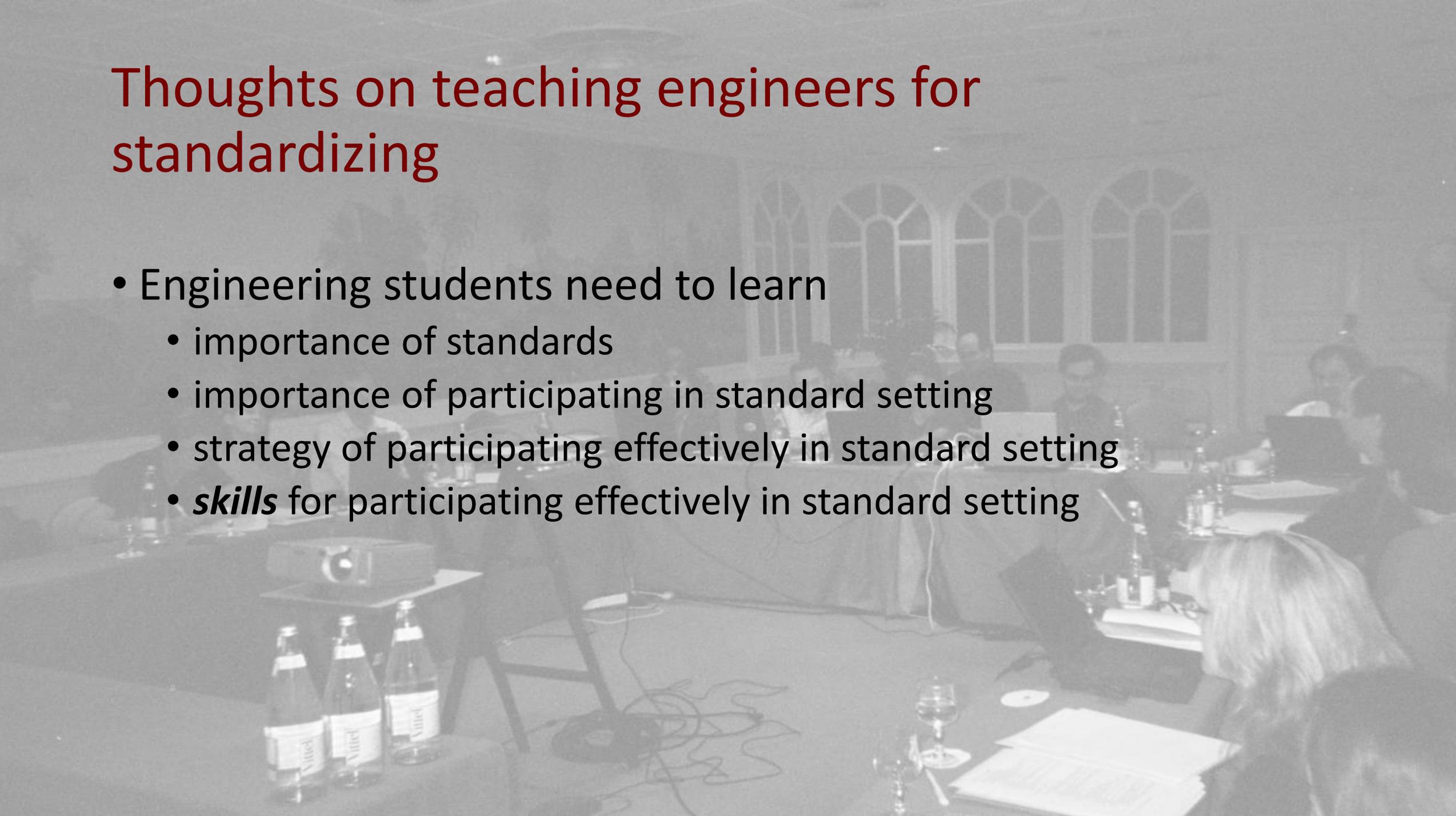
--Carl Cargill, *IT Standardization*, 1989

Example: W3C committee observed for 4 years

- Long process with multiple extensions, still not achieved recommendation
 - Individual jumps in early to help editors by drafting parts of spec; he becomes spec editor
 - Initially spec editor makes positive, appreciated contributions to spec & discussion
 - Within months developing negative dynamic of spec editor disagreeing with others and refusing to negotiate or compromise, leading to
 - Alienation of other members, reducing participation
 - Failure to move forward over long periods of time
 - Currently group is making progress towards proposed recommendation because person who refused to negotiate or compromise resigned as editor for lack of time
- **Lesson: The standard setting process suffers when key members lack ability to negotiate and compromise**

Thoughts on teaching engineers for standardizing

- Engineering students need to learn
 - importance of standards
 - importance of participating in standard setting
 - strategy of participating effectively in standard setting
 - **skills** for participating effectively in standard setting



Thoughts on teaching engineers for standardizing

- Engineers need to learn the *communication and negotiation skills* necessary to participate *effectively* in standard setting
 - In technical writing courses, learning to communicate clearly and tactfully to persuade as well as inform on standards matters
 - Engineering practice courses or workshops focused on standardization
 - Teach purpose & strategy of standard setting in particular domain
 - Conduct standards simulations, teaching standards content as well as negotiation skills needed for effective participation in standardization

Take-aways

- Engineering students need to be equipped with skills as well as knowledge around standardizing
- Simulations may be good way to teach both

