

Materials Musings

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Curiouser and Curiouser
Prof. Robert W. Cahn

My theme today is temporal coincidence in discovery and publication. In writing a historical overview of materials science, I found again and again that discoveries tend to be "in the air" and more than one person takes the crucial step at the same time. Here are some specific examples:

and so on.....

The most remarkable episode of simultaneity that I know of concerns Charles **Frank** of Bristol, England, (the same man who proposed growth spirals on crystals) and Thornton **Read** of Bell Labs, and it concerns what came to be called the Frank-Read dislocation source. Frank often visited America in the 1950s; one of his first visits was in 1950. He was supposed to lecture at Cornell University. Arriving early, he was shunted off to amuse himself for a couple of hours in the afternoon while the faculty attended a meeting (an incurable addiction of faculty!). Frank was obsessed at the time by the problem of how multiple dislocations could be generated by a single "source"...a length of dislocation in a network. As he walked around the Cornell campus that afternoon, between 3 and 5, he suddenly saw an analogy between his problem and the spiralling behavior of a dislocation during crystal growth, and the concept of a source that could generate repeated dislocation loops was born.

The next day, Frank travelled to Pittsburgh and was introduced to Thornton Read who was attending the same conference on crystal plasticity. To quote Frank's own words many years afterwards at a symposium on the history of solid-state physics (F.C. Frank, *Proceedings of the Royal Society (London)* **371**, p. 136, 1980): "John Fisher brought Thornton Read [to a hotel lobby]. Thornton, as soon as he was introduced to me, said "Frank, there is something I want to tell you" and John Fisher replied, "Frank has something to tell you." So we started talking and we found that we were telling each other what was in all basic principles the same. So I said, "When did you think of that?" and he said, "When I was drinking my tea last Wednesday afternoon about 4 o'clock." I said, "I was walking on the Cornell campus from 3 till 5." Thornton Read said, [the paper has 'John Fisher said,' but that was plainly a typo] "There is only one solution to that, you and I must write a joint publication" ([Frank and Read](#), *Philosophical Magazine*, **79**, p. 722 (1950)).

Robert W. Cahn

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Robert W. Cahn hasn't spend his time by just musing about coincidences in Materials Science. He is a veritable hero of Materials Science **and** the author of an extremely [enjoyable book](#) about the "Coming of Materials Science".