Infinite in All Directions - Query Language paradigms

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In his Gifford lectures at Aberdeen (1985), summarized in his book "Infinite in All Directions" (HarperCollins, 1989), Freeman Dyson discusses two conflicting trends in the evolution of scientific areas. One is the effort to UNIFY, i.e. to combine our knowledge of several related areas into one encompassing theory. The other, opposite, trend is the discovery of new phenomena that do not fit into currently available theories, that lead to the opening of new research directions, or even to revolutions. Prime examples in physics (Dyson's field) are the aspirations for a unified field theory and the birth of chaos theory. Naturally, these trends are also reflected in the work of individuals, often influenced by their personalities. As the title of the book suggests, Dyson believes that new fascinating directions will always exist, since Nature is infinite in all directions, and each period of unification will be followed by a period of diversification.

There has been a very large amount of work, both theoretical and pragmatic, on database query languages. Design principles and frameworks have been proposed and analyzed. After so many years, one would expect that there is a unified theory. Being a "unifier", I have indeed believed for some time that such a simple framework does exist. Yet, with the evolution of the field, new languages are constantly being proposed, often accompanying a new data model, or a new view of the role of database systems. In the talk, I will outline some of the underlying ideas proposed in frameworks for query languages, and try to argue for the "unifier" case. I will then discuss some of the new domains or models where new query languages are being proposed, and consider to what extent these fit well into the available frameworks, and if not, what new ideas seem to be useful. In particular, I will discuss languages for semi-structured data, and for data cubes.