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The purpose of theoretical work is twofold: we want to understand physical mechanisms — and we want to predict numbers which can be compared with observations. In the field of solar and stellar magnetism much of the work still belongs to the first category.

A typical example is the migration of magnetic fields in dynamo models. It has been known for a number of years that such migration occurs in $\alpha\omega$-dynamos along surfaces of isorotation. We now learn from calculations presented by Gilman that this is more general: without the explicit assumption of an α-effect the field migrates in the same way. And we obtain this result from a model which does not (yet) describe details of the solar cycle.

Another example is the attractor model described by Weiss. Although strongly simplified, this model retains some of the physical essentials of the dynamo: it produces cycles, Maunder minima and transition to chaotic behaviour. Obviously the MHD equations which govern stellar dynamos satisfy the requirements of order and non-linearity which characterize the attractor.

Or take the equivalent circuit as an analog of the coronal heating process. As explained earlier during this symposium by Chiuderi and Ionson, an ordinary and linear differential equation can demonstrate how a coronal loop is heated by waves with the loop's global resonance frequency (and it appears that in this case even quantitative predictions are possible if only the power spectrum of the driving perturbation is known).

A fourth example is the braking of stellar rotation. A star's angular momentum loss can essentially be determined from a stellar wind co-rotating out to it's Alfvénic point. This morning Roxburgh told us that such simple pictures may also illustrate the star's accelerated rotational braking when a change of magnetic multipole structure occurs in the corona: a possible explanation of the much-discussed Vaughan–Preston gap.

Detailed modelling does however depend on a knowledge of *what happens on the small scale*. This is evident for all examples mentioned above: the global circulation and dynamo model — when applied to a stellar convection zone — depends on turbulent diffusivities, and we have heard repeatedly from Schüssler and Frisch that such concepts are very much in question in the case of large Reynolds numbers. We must therefore continue to study small-scale structures such as fluxtubes in detail. We must also continue to study the detailed balance of forces in a fluxtube surrounded by a helical flow in order to get a better estimate of the α-effect which so critically enters the attractor model. So far not even the order of magnitude of α can safely be predicted. As far as coronal heating is concerned, we must continue to study MHD waves in detail in order to understand the

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dissipation mechanism, even if the total amount of heating depends little on such details. The wave properties must also be understood before we can safely employ the turbulent (wave) pressure as a driver for the stellar wind.

It is the small scale processes which determine the form and coefficients of our global models, and I am convinced that this is the area which finally will control the speed of theoretical progress.