applications in a manner analogous to the spinoffs of the switching and information theories. Indeed not every present-day systems engineer would have been able to cope directly with early Caldwell, Huffman, Shannon or Wiener; nevertheless he is now indirectly applying the results of those early investigations. It is hoped, however, that in its final form this prototype will become more accessible.

In warning the reader that his growth patterns should be seen as mathematical constructs rather than biological realities, Grenander quotes Rosen on biological morphogenesis: one investigates the *capability* of models. This reviewer has pointed out elsewhere that the similarity of patterns occurring at widely different scales is due to the fact that the specific nature of interactive forces is frequently superseded by the properties of three-dimensional space, which permit but a limited repertoire of patterns and connectivities. Therefore these mathematical constructs have a validity in equilibrium and steady-state systems, regardless of specific interactive forces.

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Spectral synthesis, by John J. Benedetto, Academic Press, Inc., New York, 1975, 278 pp., $27.50.

Let Φ be in $L^\infty(\mathbf{R})$. If Φ can be written as

$$\Phi(x) = \sum_{k=1}^{n} c_k \exp(ixy_k),$$

then the set of characters $\{\exp(ixy_k): k = 1, \ldots, n\}$ is called the spectrum of Φ and denoted $\operatorname{sp}\Phi$. The set of translates of Φ spans a finite-dimensional subspace $\mathfrak{T}_\Phi$ of $L^\infty(\mathbf{R})$, namely the linear span of $\operatorname{sp}\Phi$. In fact, $\operatorname{sp}\Phi$ is exactly the set of characters $\exp(ixy)$ belonging to $\mathfrak{T}_\Phi$. Thus the linear span of the translates of Φ is determined by its spectrum. The problem of spectral synthesis for bounded functions is to study suitable generalizations of this simple observation. That is, given Φ in $L^\infty(\mathbf{R})$, is the smallest translation-invariant subspace of $L^\infty(\mathbf{R})$ containing Φ and closed in some topology generated by the spectrum of Φ ? The problem has been studied with various topologies on $L^\infty(\mathbf{R})$, but for many purposes the most suitable is the weak-* topology. Also the setting is often generalized to a locally compact abelian group G with character group Γ. In our discussion above, $G = \mathbf{R}$ and $\Gamma = \{\exp(ixy): y \in \mathbf{R}\}$.

For the more general set-up, let Φ be in $L^\infty(G)$ and let $\mathfrak{T}_\Phi$ be the smallest weak-*-closed translation-invariant subspace of $L^\infty(G)$ containing Φ. For any weak-*-closed translation-invariant subspace $\mathfrak{T}$ of $L^\infty(G)$, we define its spectrum as $\mathfrak{T} \cap \Gamma$. And the spectrum of Φ is, by definition, the spectrum of $\mathfrak{T}_\Phi$. The spectrum is a closed subset of Γ and every closed subset E of Γ is the spectrum for at least one $\mathfrak{T}$. If there is exactly one $\mathfrak{T}$, i.e. if E determines $\mathfrak{T}$ in