applications in approximation theory. A large part of the book is devoted to the following three central problems. In each case the problem can be posed in terms of Tchebycheff systems, generalized Tchebycheff systems, or weak Tchebycheff systems. I. If a GTS is given, does it contain a GTS of order one less? II. If G is a GTS, does there exist a function f such that $G \cup \{f\}$ is a GTS? III. If a function f and an n are given, does there exist a GTS of order n containing f?

For a hint as to how such questions arise, let us cite a theorem of Krein: If $\{1, x, \ldots, x^n, f\}$ is a Tchebycheff system on $[-1, 1]$, then the polynomial p of degree at most n which minimizes $\int_{-1}^{1}|f - p|$ is the polynomial which interpolates to f at the points $\cos k\pi/(n + 2)$, $1 \leqslant k \leqslant n + 1$.

The problems mentioned above do not have clear-cut answers in all cases, and work on them continues. Zielke's account of the subject is therefore not final, but it is nevertheless a valuable summary of the current status.

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BULLETIN (New Series) OF THE
AMERICAN MATHEMATICAL SOCIETY
Volume 3, Number 1, July 1980

0002-9904/80/0000-0309/$02.00

Applied mathematics: *An intellectual orientation*, by Francis J. Murray, Mathematical Concepts and Methods in Science and Engineering, Volume 12, Plenum Press, New York-London, 1978, xiv + 255 pp.

It is essential from time to time, as the academic world revolves, and as each revolution carries us to new heights of specialization, to refresh our understanding of relationships among disciplines. What has history to do with psychoanalysis, music with computer science, economics with ecology, language with linguistics? It may also be useful on suitable occasions to ask ourselves what a given discipline actually *is* in the contemporary academic context. Professor Murray, Director of Special Research on Numerical Analysis at Duke University, has produced a book that can be regarded as the mark of such an occasion. What, in the rising clamor of academic voices fighting to be heard, *is* Applied Mathematics? Then, having done our best with that, we can examine the relationship forming a central theme of Murray's book. What has mathematics to do with physics? The questions themselves, entirely aside from the character of our answers tend to raise red flags among pure mathematicians. The prospect of finding today's theorem in the design of tomorrow's missile system, or even in next year's solar engines, is discordant with what has become the conventional view of academic mathematics. Here the strongest work is the most abstract and, *a fortiori*, application is evidence of weakness. It may not be unfair to express this view in paraphrase of a remark by Clemenceau: applied mathematics bears the relation to mathematics that military music bears to music.

Readers of the history of mathematics need not be reminded that the growth of support for such attitudes among the majority of our contemporaries–there are, of course, a few virtuoso mathematicians who practice and defend the longer tradition–is recent and swift. To ask for a definition of useful mathematics would have been as puzzling to our academic forebears as