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Nota di contenuto	1. Continuous Population Models for Single Species -- 2. Discrete Population Models for a Single Species -- 3. Continuous Models for Interacting Populations -- 4. Discrete Growth Models for Interacting Populations -- 5. Reaction Kinetics -- 6. Biological Oscillators and Switches -- 7. Belousov-Zhabotinskii Reaction -- 8. Perturbed and Coupled Oscillators and Black Holes -- 9. Reaction Diffusion, Chemotaxis and Non-local Mechanisms -- 10. Oscillator Generated Wave Phenomena and Central Pattern Generators -- 11. Biological Waves: Single Species Models -- 12. Biological Waves: Multi-species Reaction Diffusion Models -- 13. Travelling Waves in Reaction Diffusion Systems with Weak Diffusion: Analytical Techniques and Results -- 14. Spatial Pattern Formation with Reaction/Population Interaction Diffusion Mechanisms -- 15. Animal Coat Patterns and Other Practical Applications of Reaction Diffusion Mechanisms -- 16. Neural Models of Pattern Formation -- 17. Mechanical Models for Generating Pattern and Form in Development -- 18. Evolution and Developmental Programmes -- 19. Epidemic Models and the Dynamics of Infectious Diseases -- 20. Geographic Spread of Epidemics -- Appendices -- 1. Phase Plane

Analysis -- 2. Routh-Hurwitz Conditions, Jury Conditions, Descartes' Rule of Signs and Exact Solutions of a Cubic -- 3. Hopf Bifurcation Theorem and Limit Cycles -- 4. General Results for the Laplacian Operator in Bounded Domains.

Sommario/riassunto

Mathematics has always benefited from its involvement with developing sciences. Each successive interaction revitalises and enhances the field. Biomedical science is clearly the premier science of the foreseeable future. For the continuing health of their subject mathematicians must become involved with biology. With the example of how mathematics has benefited from and influenced physics, it is clear that if mathematicians do not become involved in the biosciences they will simply not be a part of what are likely to be the most important and exciting scientific discoveries of all time. Mathematical biology is a fast growing, well recognised, albeit not clearly defined, subject and is, to my mind, the most exciting modern application of mathematics. The increasing use of mathematics in biology is inevitable as biol-ogy becomes more quantitative. The complexity of the biological sciences makes interdisciplinary involvement essential. For the mathematician, biology opens up new and exciting branches while for the biologist mathematical modelling offers another research tool commmensurate with a new powerful laboratory technique but only if used appropriately and its limitations recognised. However, the use of esoteric mathematics arrogantly applied to biological problems by mathemati-cians who know little about the real biology, together with unsubstantiated claims as to how important such theories are, does little to promote the interdisciplinary involvement which is so essential. Mathematical biology research, to be useful and interesting, must be relevant biologically.