

Editors' preface

The initial impetus to organize a book on the role algae play in human affairs came during a symposium sponsored by the Phycological Society of America on "Environmental roles of algae and their impact on society" (Indiana University, Bloomington, August 1981). At that time it was becoming apparent that the productivity associated with algae in natural communities could be harnessed commercially into productivity tailored to human specifications. A driving force in this development was the petroleum shortage experienced in the 1970s and the emergence of biotechnology. The rapid increase in research and development of algal biomass cultivation technology for specialty chemicals, food, and energy is a testament to the concept that algae can play new and different roles in relation to humanity. As of this writing (early 1988), a (likely) temporary excess of petroleum supplies has pushed crude oil prices low enough to dampen domestic enthusiasm for cultivating algae as biomass for economical fuels. However, the investigation of algae for specialty uses and products such as hydrocolloids, carotene, gourmet foods, and diatomaceous earth continues at an exciting pace.

The impact of algae on human society is not limited to those that we harvest or grow for their economically useful products. From early in biotic evolution, algae played essential roles with significant and lasting impacts on the biosphere. Through photosynthesis they poured oxygen into the atmosphere billions of years ago. Their fossil remains have produced black pools of petroleum deep within the earth and the famous white chalk cliffs at Dover. Directly, algae are the major source of food for many aquatic organisms from copepods to abalone and, indirectly, they are essential links in food chains of creatures such as lobster and salmon. In their most infamous roles they sometimes are nuisance organisms, their blooming billions polluting water supplies with foul tastes, odors, and even toxins, and when they find their way into the flesh of shellfish they leave a paralyzing, deadly toxin for imprudent consumers of oysters, clams, and mussels. In such nefarious roles they cause millions of dollars of economic disruption.

We believe algae have a bright future and that ways will be found to minimize their adverse effects and maximize their positive impacts on human society. However, such developments will require fresh, imagi-

native, and innovative thinking. Fortunately, in many areas this process is well under way. For example, the highly efficient light-harvesting pigments of certain seaweeds are now being coupled to antibodies where they become brilliant fluorescent labels for antigens in cell biology and medical diagnosis. In certain localities, the high productivity of microscopic freshwater algae has been used to harness solar energy and treat sewage. We hope that reference to these examples will stimulate interest in reading many or all the chapters that recount the interreactions of algae with humans and will lead to the recognition that algae have a past, present, and future partnership with people.

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