Tumors in Aquatic Animals

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Papers presented at the Symposium on Tumors in Aquatic Animals, Cork, October 1974, and other original papers in this field

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Volume Editors: Clyde J. Da we, Bethesda, Md., Dante G. Scarpelli, and Sefton R. Wellings, Davis, Calif.

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Editor's Foreword

As long as the true causes of the diseases we call 'cancer' elude our knowledge, it will remain impossible to identify that work which constitutes true progress in tumor research. The best possible guess must be made, and only history will prove it right or wrong.

The wider the net is cast, the more likely one's success. Thus, after having previously included in our series subjects as far removed from man as plant tumors, we now present a volume on neoplasms in aquatic animals. The rationale for this, of course, is better than a mere guess. The aquatic element is one of the ultimate recipients of man's environmental pollution and the organisms populating it are subject to the same or even more concentrated chemical and biological pollutants as man. Therefore, aquatic organisms may turn out to be sensitive indicators of what awaits man in terms of water-borne pollutant carcinogens.

This volume continues the system of volume guest editors, for more knowledgeable planning of this series than one individual could hope to achieve.
The series editor is most grateful to Dr. Clyde J. Dawe, whose editorial achievement in the present volume speaks for itself, and to the co-guest editors, Dante G. Scarpelli and Sefton R. Wellings; he acknowledges most gratefully the faithful cooperation of this series’ editorial assistant Mrs. Mary Miller and the many authors who contributed to this volume.

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Guest Editors’ Foreword

On October 15-18, 1974, a small group of investigators gathered at University College, Cork, Ireland, to exchange information on the topic of ‘Neoplasms in Aquatic Animals as Indicators of Environmental Carcinogens’. The symposium was organized under the auspices of the International Union against Cancer (UICC), and for the funds that made the event possible, the UICC wishes to acknowledge the support of the Canadian Cancer Society, the National Cancer Institute of Canada, and the Sir Samuel Scott of Yews Charitable Trust of London. The papers presented in this section of this volume formed the substance of that symposium.

The background of the meeting is as follows: In 1969, with urgings from Dr. Harold L. Stewart, the Executive Council of the International Union against Cancer decided to create and support a Committee on Comparative Oncology, one of three groups to work within the Commission on Epidemiology headed by Dr. Gregory T. O’Conor. This new Committee on Comparative Oncology of the UICC was specifically charged to explore a rather remote and still obscure frontier the study of neoplasms in aquatic cold-blooded vertebrates and invertebrates. One objective of the committee was to find out whether some of the tumors already known to occur in fishes and molluscs are caused by environmental agents that might also endanger people, either as contaminants of drinking water or as contaminants of fish and molluscs eaten in the diet. A secondary objective was to determine whether some of the neoplastic diseases in question might constitute laboratory systems useful for study of the mechanisms of neoplastic development.

The ten original members of the committee, meeting at the Fogarty International Center of the National Institutes of Health in Bethesda, Md., on October 15-16, 1970, were: Sefton R. Wellings (papillomas in pleuronectid fishes); Robert Deys (papillomas in European eels); Edgar Lee (papillomas...
in Iridio bivitatta, a south Atlantic reef fish; John C. Harshbarger (papillomas in white croakers and in brown bullheads); Clyde J. Dawe (cholangiomas in white suckers in Maryland); Maire F. Mulcahy (lymphomas in northern pike in Ireland); Lionel E. Mawdesley-Thomas (neoplasms in a variety of European fishes); Yohei Ito (papillomas of gobies and pleuronectid fishes in Japan); Aaron Rosenfield (diseases of fish and shellfish of Chesapeake Bay), and Peter Wolf (papillary epitheliomas of the mantle in oysters of the Australian east coast). Also present were Austin C. Farley, who had recently reported several types of neoplasms in oysters and clams from estuaries of both east and west coasts of the United States; Gregory T. O'Connor, Chairman of the Commission on Epidemiology of the UICC; Harold L. Stewart, retiring Council member of the UICC; Robert M. Taylor, then Secretary General of the UICC, and William U. Gardner, then President of the UICC.

An observation that aroused curiosity and speculation was that most, though not all (the northern pike being a notable exception) of the aquatic animals subject to high prevalence of neoplasms, particularly papillomas, were bottom feeders or filter feeders. Did this indicate that tumor-inducing agents, whether chemical or viral, might be concentrated by adsorption to bottom sediments or suspended particles? The question, of course, was unanswered then, and still is.

The proceedings of the first meeting were not published, but it was decided that a symposium should be held in 1974 just prior to the Xlth International Cancer Congress.

Dr. Lionel E. Mawdesley-Thomas began preparations to serve as host to the proposed symposium at his home institution, the Huntingdon Research Centre, in Huntingdon, England. Then, late in 1973, his many friends and collaborators were dismayed to learn that he had been taken seriously ill. Dr. Maire Mulcahy took over the work of organizing and conducting the meeting at University College, Cork, but it was a task made onerous by news of Lionel's death only a month before the symposium took place. It is an expression of the wide admiration held for Lionel E. Mawdesley-Thomas that this volume is dedicated to him.

How the symposium came to be published in a volume of this series, 'Progress in Experimental Tumor Research', is another story. Originally, it was to have been published as a volume unto itself by the UICC. But some two years before the symposium, Dr. Homburger, editor of this series, proposed to publish a volume on 'Tumors in Aquatic Animals'. The guest editors observed that if two such publications were to appear within a short
period, both would either be incomplete or would share much overlap and duplication. And so, with the consent of the UICC, it was agreed to include the proceedings of the symposium as a section of this volume.

Readers will observe that the two tumor systems in aquatic animals that have made the greatest impact on cancer research are not included in this symposium. These are the renal adenocarcinomas (Lucké tumor) in leopard frogs and the aflatoxin-induced hepatic neoplasms in rainbow trout. These omissions are intentional, as there already exist volumes devoted to both subjects.

The stories told here, therefore, are those that are not so widely known to cancer researchers in general, or that have only begun to be told in the sense that much knowledge of the type considered elementary for most tumor systems still is unknown for those presented in this symposium. Indeed, some tumors and tumor epizootics are reported here for the first time. In the interval between 1970 and 1974, additional investigators who made discoveries relating to the Committee’s objectives were invited to join in the activities.

Those working in this area of cancer research are only too keenly aware that, for the most part, it is still in that stage of development comparable to the romantic phase of learning, as described by Alfred North Whitehead. But in some part it is beginning to enter the precision phase. Past experience tells us that scientific progress almost invariably comes more rapidly than one anticipates. It is likely, therefore, that future meetings on this subject will be characterized by greater sophistication, a flood of more finely detailed information, and more critical attitudes. It is improbable, however, that any future meeting will recapture a comparable aura of fresh experience accented by a setting as enchanting as that of University College, Cork.

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Dedication

This volume is dedicated to the memory of Lionel E. Mawdesley-Thomas, a gifted person and able researcher in oncology. To Lionel a tumor was no less interesting if its host happened to be a fish.