

Introduction to the Issue on Lasers in Medicine

LASERS have been used in medicine almost immediately following the invention of the laser. One of the first applications involved the use of a ruby laser to weld a detached retina in place in the eye. Early use of the laser had its detrimental effects as well. Experiments at the National Institute of Health with *Q*-switched ruby lasers, aimed at cancer tumor destruction, showed spreading of cancer and resulted in such bad press that laser medical research had great difficulty in gaining funding. However, later research using different lasers and techniques showed great benefit in treating precancerous lesions.

Indeed the research goes on to find the proper laser parameters to produce acceptable outcomes for many otherwise difficult medical problems. This issue is a continuation of numerous successful issues published previously in the *JOURNAL OF QUANTUM ELECTRONICS*. the publishing of these issues in *JQE* temporarily stopped with one done in 1991 due to the crowding of other work to this journal. The series continues now with the creation of a place for special topics for this *JOURNAL*.

This issue picks up many topics that have evolved since 1991 as well as many new areas that have become possible due to advances in laser technology. Current topics involved ultra-short laser breakdown, cavitation bubble generation, plasma effects, ablation physics and medical outcome, time-gated imaging, new advances in fiber optics and waveguide tech-

nology, optical coherence tomography, and new work in holographic display.

In addition, a new area is emerging that might be called optical diagnostics—the use of light and its photoproducts to determine the status of the body, its organs, cells or molecules. We are not alone in recognizing the importance of this field. The European Laser Association is preparing a special issue on Diagnostic Application of (Laser) Light with a deadline for submissions of June 1, 1997. (See notice at the end of the issue.)

Also, we would like to thank those members of the laser medicine and biology research community around the world who gave their time and expertise to review and constructively evaluate all the papers. The reviewers put up with our requests to hurry their reviews, utilize expensive, rapid communication means and to swiftly generate their constructive comments to the editors. This helped greatly. However, in addition to writing their papers in an all too short allotted time, the authors deserve our thanks for so willingly tolerating both the reviewers questions and comments as well as the editors' demands for quick return of the manuscripts. Without excellent authors and constructive reviewers, this issue could not have succeeded.

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Publisher Item Identifier S 1077-260X(96)09769-9.



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In 1962, he joined the Westinghouse Electric Corporation, where he worked on solid-state lasers and gas breakdown. In 1969, he joined the Naval Research Laboratory, Washington, DC, where he worked on UV and VUV gas lasers, excimer laser kinetics, mid-infrared lasers, and novel laser pumping schemes resulting in RF pumped excimers and solid-state VUV lasers. In 1986, he joined the Food and Drug Administration to work on laser interactions in surgery and medicine, and in fiber delivery, fiber optical diagnosis, and fiber dosimetry in the medical area. he is also an Adjunct Associate Professor at Catholic University.

Dr. Waynant has organized and chaired conferences for the Engineering Foundation, in both the laser medical and the short wavelength laser areas. He is also a Fellow of the Optical Society of America, and serves as Editor-in-Chief of the *IEEE Circuits and Devices Magazine*.

He was also Co-Guest Editor for the Short Wavelength Lasers and Applications Issue of this *JOURNAL*.