



Tom Dougherty: A memorial



Although we both started work at Roswell Park Cancer Institute (Buffalo, New York) in 1970, I first met Tom Dougherty in 1979 as the result of a conversation with the late Donn Boyle. Donn had been working with Tom since his days at DuPont, and spoke enthusiastically about treating patients with what we now call Photodynamic Therapy. PDT was the new modality Tom had discovered for treating cancer. Donn said they needed help with the physics. I was a physicist. It sounded exciting. I began working with Tom on light delivery and dosimetry in living tissue. It was the start of a close and wide ranging collaboration that continued for over thirty years.

During those years Tom's life was dedicated to developing his discovery into a new way to treat cancer. The only way I can explain my great respect for the man is to tell the story of a few of the many trials he faced in his work and the grace he displayed under enormous pressure for so long.

I know many of you knew Tom but if you did not, two paragraphs from his auto biography will give you some sense of the man:

"The development of photodynamic therapy has been an incredible journey even with all its ups and downs. Today PDT is being used to treat a large number of cancers and some benign conditions. My companions on this adventure have been scientists, physicians, nurses, family and friends- but truth be told, the powerful gusts of wind beneath our wings have been most certainly our patients."

"This final chapter acknowledges the thousands of PDT patients, both in the United States and abroad whose courage and altruism, trust- and a strong belief in the advancement of science and medicine- helped us launch a new therapy. Our patients are both the heroes and pioneers of this story, the men and women who were on the front lines in every battle we fought- both big and small- over the years. Theirs are stories of hope and triumph."

When you read Tom's autobiography, and you should, the kindness and humor jumps off the page at you. Tom tells us: "If your heart is open and not filled with meanness destiny will take you to wonderful places". A beautiful thought coming from a place of deep humility and gratitude. The autobiography paints an accurate picture of moments of

triumph punctuating years of persistent striving through frequent times of despair. The path to wonderful places was often very painful to walk.

Tom was a very kind and generous man. He created an atmosphere of trust and cooperation in his lab that is rare today in the highly competitive world of science. Over the years we enjoyed many parties at his home. His group was very much an extended family. We all loved and respected him.

Tom was a highly motivated volunteer in the war on cancer. His motivation began when, at 16, he witnessed the radiation treatment of his grandmother's breast cancer. He knew there had to be a better way.

He made significant sacrifices to do the work he did. He took a big pay cut when he left DuPont and joined Roswell Park. At Roswell he entered a world where grant money was needed to do significant work. Writing a grant and getting it funded is a highly competitive process.

He gave away a very valuable discovery a lesser man would have tried to keep. He did this because he saw the only way forward was to share freely what he had found.

Few people know that New York State waited until the last moment and then refused to file a patent on the discovery of PDT. According to our understanding of the employment contract, the rights then became the property of the inventors.

Tom and the late Ken Weishaupt mortgaged their homes, formed a company, filed a patent and moved toward commercialization. Only then did Albany realize its error and claim they owned the patent right no matter what the contract with employees said. Tom agreed. He understood that standing between the State and a dollar is a very dangerous position. Roswell generously licensed the patent back to us for only half of the company. We all called this deal a win-win and it was. Others might call it something else.

Tom gave his drug to any responsible investigator who wanted to work with it. This horrified everyone in big pharma where the first principle of drug development is to keep everything in house under tight control to prevent some cowboy from creating a disaster.

You cannot imagine what the words "regulatory burden" mean until you actually try to make a drug under FDA rules.

The FDA had been kind enough to slowly tighten its regulatory screws so the costs of continuing to give away drug only rose slowly.

When the drug give away became financially impossible, the company began to charge for the product to cover some of the cost of manufacture. Tom was sharply criticized by some for trying to "Profit from research carried out at public expense". Few knew the price of the drug was less than the cost of production under FDA rules.

In the beginning Tom was frequently attacked by people who spoke from a position grounded in complete ignorance of the reality governing what he was attempting. They questioned his science and his integrity.

Our business model was designed to advance our drug through the

early stages of FDA approval on a shoestring budget. There was a small glitch in this plan. It was not actually legal to sell an experimental drug and at one point Ken was taken to jail in handcuffs. The matter was resolved favorably when we demonstrated that to follow any other course would kill the project.

Tom was never motivated by a desired for personal wealth. When his company was sold to Johnson & Johnson, Tom gave away everything he made to a charitable foundation he set up. Having seen Foundations ignore their charter once their founders were gone, Tom's foundation gave away everything before his death. Most of the money went to support work at Roswell. Tom loved Roswell for what it could be at its best.

When he formed the company he and Ken Weishaupt worked to interest investors. Ken did the work of setting up and running the company.

We all believed in what we were doing.

In the business end of PDT we were often faced with duplicity. At times we were told one thing but when read with great care the fine print said just the opposite. There was a comma in a contract. Had it been a semicolon millions of dollars would have been owed us. The failure to notice the word "over" printed in microscopic type at the bottom of a page from the US patent office was also very costly to the enterprise. We managed to avoid most of the traps set for us but not all.

There was a long complex struggle to get a drug company to invest the roughly 30 million dollars needed to jump through all the hoops required to receive FDA approval to market the drug. At last Lederle Labs stepped up and got the FDA approval. Lederle was soon bought by American Home Products a soap selling conglomerate where there was a great interest in the bottom line.

Lederle was of course eviscerated. Everything that did not return enough profit was liquidated. Once again PDT was in peril.

At the end of the day and throughout this long struggle there runs a unifying thread. A drug used as a single dose was so unprecedented in the world of big pharma that no one wanted to touch it. It was just not profitable enough. No one, not even big pharma, had the audacity to dream that raising the price twenty fold would solve the problem.

Today big price increases by small drug companies are quite fashionable. The drug is now marketed by a small privately held company. They had no problem with the idea of a twenty fold price increase. The current cost is between \$20,000 and \$40,000. Drug sales are unaffected. Another win-win.

How was this figure arrived at Tom asked? The answer sounded quite reasonable: Simply look at the total cost of treatments for the same condition and ask: Does PDT offer an attractive alternative? If the answer is yes, price your PDT drug similarly. It seemed from this explanation the "market" had valued our drug, but unfortunately market forces are prevented by law from restraining drug prices.

Tom was, to put it delicately, impressed by this development. It was the end of our dream of an affordable cancer treatment and the last of many painful lessons.

Sometimes when you make a better mouse trap the world will beat you over the head with it, but if Tom were here he would tell us that the journey was worth the cost.

When things were really bad, he used to tell me "If one life is saved it is all worth it." Coming from another this might have sounded false but from Tom it was quite moving.

At his core Tom was propelled by an absolute determination to

actually do something to improve cancer treatment. There was a simplicity and a purity to his motivation. It dominated his life. He never talked about it. That would have been a redundant discussion of the obvious. Beneath the gentle surface was a will of iron and it gave him his ability to inspire others to walk his path. It explained his ability to lead.

Although Tom never spoke to me about his faith, his life was the purest expression of applied Christianity I have ever encountered.

In spite of his accomplishments Tom was never full of himself. He felt it was all just a happy accident. He could not believe he was doing this work.

Clearly Tom was a man of unyielding determination, but without his kindness and generosity he would never have been able to get so many investigators all over the world working with him on his discovery.

Tom had a wonderful sense of humor and a great laugh. Donn Boyle had a razor sharp mind with insights he usually hid behind a slight smile, seeming to view the world as a secret joke that only he was appreciating. Boyle used to say "when you plan to break the rules remember it is much easier to receive forgiveness than permission. But you had better have been right"

The spirit and atmosphere of any organization radiates down from the top and for good or ill infects the whole group. With a leader like Tom we could never take ourselves too seriously although the work was deadly serious. Patient's lives were at stake but we never thought: How wonderful we are curing cancer. Only time could establish the value of what we were doing.

There is no doubt many people all over the world would not be alive today without the benefit of Tom's discovery. Thousands of those people live in China where our findings were quickly appreciated and widely applied. There is a statue of Tom in China honoring him for his work.

I will always be indebted to Tom for a far more meaningful life and career than I could ever have imagined.

Today the torch passes to younger hands. As PDT is still in many ways a mystery, Tom might commend to younger investigators some of the words the poet Tennyson gave to an aging Ulysses, setting out into the unknown on a final voyage of discovery.

Come, my friends,
 'Tis not too late to seek a newer world....
 For my purpose holds
 To sail beyond the sunset, and the baths
 Of all the western stars, until I die....
 Though much is taken, much abides; and though
 We are not now that strength which in old days
 Moved earth and heaven; that which we are, we are;
 One equal temper of heroic hearts,
 Made weak by time and fate, but strong in will
 To strive, to seek, to find, and not to yield.

The work Tom began in 1972 continues, but with his death the world has lost a very bright light and we have lost a dear friend.

He will be missed.

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