Preface

Some years ago when I was chair of the department of civil and environmental engineering, a colleague introduced me to a visitor from Sandia Laboratories, perhaps the largest developer of armaments and weapons systems in the world. We had a nice visit, and as we chatted, the talk naturally centered on the visitor's engineering work. It turned out that his job in recent years had been to develop a new acoustic triggering device for bombs. As he explained it, the problem with bombs was that the plunger triggering mechanism could fail if the bomb hit at an angle, and thus the explosives would not detonate. To get around this, he developed an acoustic trigger that would detonate the explosives as soon as the bomb hit any solid surface, even at an angle.

As he talked, I watched his face. His enthusiasm for his work was clearly evident, and his animated explanations of what they had developed at Sandia exuded pride and excitement.

I thought about asking him what it felt like to have spent his engineering career designing better ways to kill people or to destroy property – the sole purpose of a bomb. I wondered how many people had been killed because this man had developed a clever acoustic triggering device.

But good sense and decorum prevailed and I did not ask him such questions. We parted as friends and in good spirits.

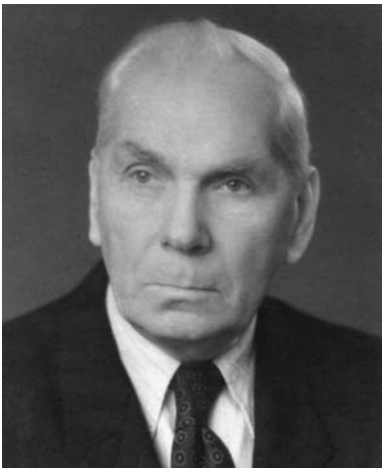
Afterwards I thought about him as an exemplar of an engineer who is so focused on engineering that it would never occur to him to ask himself what his work is good for and how it might be used. Many engineers are like that – they put on blinders when it comes to their work so that they don't see the moral implications.

This book is about, and mainly for, engineers who have concerns about their own work and the profession of engineering. My argument is that engineering can in a rough way be divided into three categories: military engineering, civilian engineering, and what I call peace engineering. I demonstrate the essence of these divisions within professional engineering by using short biographies of real engineers who have, in my opinion, exemplified these three engineering paradigms. My hope is that, in reading about exemplary engineers, others will be able to bet-

ter understand their own jobs and, most importantly, recognize that there are alternative engineering careers available to them that would proactively promote peace and justice for all.

Much material in this book is the result of a long career in engineering education and practice, and I am indebted to the many engineers with whom I have had discussions on the role of professional engineering in our society. The concept of "peace engineering" was formulated when I was the R. L. Rooke Chair of the Historical and Societal Context of Engineering at Bucknell University, and I am grateful to the faculty and students at Bucknell for their support and encouragement.

The entire manuscript was read by Pamela Vesilind and Libby Vesilind, both of whom are not only fine writers but also effective critics who did not hesitate to challenge me on elements of grammar, style, or logic. Their hard work is very much appreciated.



August Rebane (1885–1965)

Finally, I want to acknowledge the influence my maternal grandfather, August Rebane, had in defining my own world view, or *Weltanschauung*. When I last saw my grandfather I was 5 years old and my family was fleeing Estonia to escape the Soviet Red Terror in 1944. So I cannot say that I learned anything from him in the normal way a grandfather teaches a grandson. But I know him through my mother's stories and recollections. And even many years after his death, I feel his presence in my own thoughts and beliefs. He was an idealist who sought freedom for Estonia, and then did his best to establish a socialist government in the newly formed republic, believing that this was the fair and equitable thing to do. He was a gentle pacifist whose friends loved him for his humor and kindness. I know who I am because of the bond of kinship between my grandfather and me, and it is therefore with humility and gratitude that I dedicate this book to August Rebane.

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