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## "Pieces of the Action"

*Pieces of the Action*\* was written by Vannevar Bush, who at 80 draws on wide experience gained while successfully tackling problems at least as rough as those we face today. Bush was this nation's scientific leader during World War II. Never before or since have science and technology been so effectively employed to meet national purposes. The book draws on memories of events spread over the past 60 years. It surveys the present scene but gives particular attention to events that occurred during World War II. Bush does not systematically outline the key elements of his successful leadership, but a reading of the book provides clues and some lessons applicable to today or tomorrow.

In part, Bush's genius lay in organization. During the late 1930's he and a small group of associates could foresee the coming war, and they realized that, if science and technology were to be used effectively, a new organization partaking of the powers of the White House would be required. Bush at that time was president of the Carnegie Institution of Washington and chairman of the National Advisory Committee for Aeronautics. He had access to President Roosevelt and especially to Harry Hopkins, the President's special adviser. Bush had established an excellent working relationship with Harry Hopkins and was ready with a plan of action at the time of the fall of France, in 1940. Very quickly the National Defense Research Committee was authorized and began its remarkably successful work. Bush retained primary responsibility for important external contacts, such as those with Congress and the military, although he delegated responsibility for the scientific and engineering efforts. He saw to it that decisions were made rapidly and that there was excellent two-way communication throughout the organization. Once ideas crystallized they were quickly implemented in prototypes, and these were speedily tested. Getting the military to adopt new devices or methods was sometimes difficult. However, though Bush is naturally combative, he was careful not to use improperly his special relationship to the White House. In his description of incidents where his qualities of leadership were involved, Bush makes his actions seem logical and obvious. It really wasn't all easy. Some excellent judgment and self-discipline were required. For example, Roosevelt sometimes demanded opinions on subjects with which Bush was not entirely conversant. Bush would give an immediate answer but would subsequently consult expert opinion on the matter. If he learned that his answer had not been entirely sound, he would so inform the White House.

Throughout the book one has the impression of listening to an interesting conversationalist, and an optimistic one. In fact, he says, "we take ourselves too seriously these days. Something sad appears to have happened to our sense of humor. It is true that our outlook is grim; we face many tough problems. We have to tackle them with determination, and we will do a better job at it if we do not let them get us down—pitch us into gloom and frantic despair . . . Life can be gay even as it is grim."

We have come to recognize that our future is inextricably dependent on our management of science and technology. Talk of doom and disaster are in the air because many people fear that neither individuals nor society as a whole have the gumption to live comfortably with, and to manage, the changing technological problems. It is therefore refreshing to read a book dealing with science and technology that is optimistic in tone while not dodging the troublesome issues.—PHILIP H. ABELSON

\* V. Bush, *Pieces of the Action* (Morrow, New York, 1970).