THEY LED THE WAY

Richard W. Schuelzer
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Rensselaer Polytechnic Institute
Troy, New York 12180
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>They Led the Way</td>
<td>1</td>
</tr>
<tr>
<td>Foreword</td>
<td>8</td>
</tr>
<tr>
<td>They Led Industry</td>
<td>10</td>
</tr>
<tr>
<td>Sherrod Skinner</td>
<td>10</td>
</tr>
<tr>
<td>Erik Jonsson</td>
<td>14</td>
</tr>
<tr>
<td>Vollmer W. Fries</td>
<td>18</td>
</tr>
<tr>
<td>James M. Hait</td>
<td>20</td>
</tr>
<tr>
<td>Charles H. Rybolt</td>
<td>22</td>
</tr>
<tr>
<td>Augustine R. Marusi</td>
<td>24</td>
</tr>
<tr>
<td>George A. Strichman</td>
<td>27</td>
</tr>
<tr>
<td>William D. Stevens</td>
<td>29</td>
</tr>
<tr>
<td>Walter A. Fallon</td>
<td>31</td>
</tr>
<tr>
<td>John F. Daly</td>
<td>33</td>
</tr>
<tr>
<td>Stanley I. Landgraf</td>
<td>35</td>
</tr>
<tr>
<td>Edgar M. Cortright</td>
<td>37</td>
</tr>
<tr>
<td>William R. Haselton</td>
<td>40</td>
</tr>
<tr>
<td>Companies With Specific</td>
<td></td>
</tr>
<tr>
<td>Ties to Rensselaer</td>
<td>41</td>
</tr>
<tr>
<td>General Electric Co.</td>
<td></td>
</tr>
<tr>
<td>Robert Paxton</td>
<td>42</td>
</tr>
<tr>
<td>Otto Klima, Jr.</td>
<td>45</td>
</tr>
<tr>
<td>Donald E. Debacher</td>
<td>47</td>
</tr>
<tr>
<td>Thomas Romanach</td>
<td>49</td>
</tr>
<tr>
<td>Nancy DeLoye Fitzroy</td>
<td>52</td>
</tr>
<tr>
<td>Thomas H. Lee</td>
<td>54</td>
</tr>
<tr>
<td>Chicago Bridge &amp; Iron Co.</td>
<td>56</td>
</tr>
<tr>
<td>George Terry Horton</td>
<td>59</td>
</tr>
<tr>
<td>Harry J. Clarke</td>
<td>61</td>
</tr>
<tr>
<td>John T. Horton</td>
<td>63</td>
</tr>
<tr>
<td>They Founded Companies</td>
<td>65</td>
</tr>
<tr>
<td>Walter E. Irving</td>
<td>65</td>
</tr>
<tr>
<td>Sanford Cluett</td>
<td>68</td>
</tr>
<tr>
<td>Allen B. DuMont</td>
<td>70</td>
</tr>
<tr>
<td>Wallace Rudd</td>
<td>72</td>
</tr>
<tr>
<td>John J. Redfern, Jr.</td>
<td>74</td>
</tr>
<tr>
<td>Hugh Archer</td>
<td>77</td>
</tr>
<tr>
<td>Royden C. Sanders, Jr.</td>
<td>79</td>
</tr>
<tr>
<td>Keeve M. Siegel</td>
<td>80</td>
</tr>
<tr>
<td>Harry Apkarian</td>
<td>81</td>
</tr>
<tr>
<td>Heinz Joseph Gerber</td>
<td>83</td>
</tr>
<tr>
<td>Robert Fopeano</td>
<td>86</td>
</tr>
<tr>
<td>Public Utilities Executives</td>
<td>89</td>
</tr>
<tr>
<td>Allan D. Colvin</td>
<td>89</td>
</tr>
<tr>
<td>Kenneth P. Applegate</td>
<td>92</td>
</tr>
<tr>
<td>Raymond W. Gibson</td>
<td>96</td>
</tr>
<tr>
<td>George L. Capwell</td>
<td>98</td>
</tr>
<tr>
<td>George S. Beinetti</td>
<td>100</td>
</tr>
<tr>
<td>Wells P. Allen, Jr.</td>
<td>102</td>
</tr>
<tr>
<td>Carolyn Chin</td>
<td>103</td>
</tr>
<tr>
<td>Roberta A. Kankus</td>
<td>105</td>
</tr>
<tr>
<td>Eminent Engineers</td>
<td>107</td>
</tr>
<tr>
<td>Emil H. Praeger</td>
<td>110</td>
</tr>
<tr>
<td>Milton Brumer</td>
<td>112</td>
</tr>
<tr>
<td>Clay Patrick Bedford</td>
<td>115</td>
</tr>
<tr>
<td>Bertram D. Tallamy</td>
<td>119</td>
</tr>
<tr>
<td>Ralph B. Peck</td>
<td>122</td>
</tr>
<tr>
<td>Robt. H. Widmer</td>
<td>125</td>
</tr>
<tr>
<td>Seymour Bogdonoff</td>
<td>127</td>
</tr>
<tr>
<td>Alan M. Voorhees</td>
<td>129</td>
</tr>
<tr>
<td>Edward Woll</td>
<td>131</td>
</tr>
<tr>
<td>Robt. G. Loewy</td>
<td>133</td>
</tr>
<tr>
<td>Sheldon Roberts</td>
<td>136</td>
</tr>
<tr>
<td>Anthony J. De Maria</td>
<td>138</td>
</tr>
<tr>
<td>Scientists</td>
<td>141</td>
</tr>
<tr>
<td>W. Lincoln Hawkins</td>
<td>141</td>
</tr>
<tr>
<td>Milton M. &amp; Zaka I.Slawsky</td>
<td>143</td>
</tr>
<tr>
<td>S. David Pomrinse</td>
<td>145</td>
</tr>
<tr>
<td>Edwin C. Holmer</td>
<td>147</td>
</tr>
<tr>
<td>Ronald Estabrook</td>
<td>148</td>
</tr>
<tr>
<td>Joseph A. Kardys</td>
<td>149</td>
</tr>
<tr>
<td>Ivar Giaever</td>
<td>151</td>
</tr>
<tr>
<td>Architects</td>
<td>153</td>
</tr>
<tr>
<td>Donald J. Stephens</td>
<td>153</td>
</tr>
<tr>
<td>Frank J. Matzke</td>
<td>155</td>
</tr>
<tr>
<td>Donald J. Williams</td>
<td>157</td>
</tr>
<tr>
<td>J. Robert Gilchrist</td>
<td>159</td>
</tr>
<tr>
<td>Lawrence P. Melillo</td>
<td>161</td>
</tr>
<tr>
<td>John H. Griffis</td>
<td>163</td>
</tr>
<tr>
<td>Bernd Foerster</td>
<td>164</td>
</tr>
<tr>
<td>Peter Q. Bohlin</td>
<td>166</td>
</tr>
<tr>
<td>Richard Powell</td>
<td>166</td>
</tr>
<tr>
<td>TABLE OF CONTENTS (continued)</td>
<td>Managers of Money</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Architects (continued)</td>
<td>Edward C. Harwood 252</td>
</tr>
<tr>
<td>Michael D. Spear 168</td>
<td>William S. Corey 255</td>
</tr>
<tr>
<td>The Non-Technologists 170</td>
<td>Carl J. Thomsen 257</td>
</tr>
<tr>
<td>Edward P. Hamilton 170</td>
<td>Joseph A. Rice 259</td>
</tr>
<tr>
<td>James E. Blackburn 172</td>
<td>William G. Lillis 260</td>
</tr>
<tr>
<td>Isadore Fixman 174</td>
<td>George P. DiNardo 262</td>
</tr>
<tr>
<td>Samuel Josefowitz 176</td>
<td>Glen M. Mueller 264</td>
</tr>
<tr>
<td>Most Rev. Juan A. Arzube 178</td>
<td>G. Robert Tod 266</td>
</tr>
<tr>
<td>Malcolm Starr 180</td>
<td>Martin Siegel 268</td>
</tr>
<tr>
<td>Christopher Jaffe 182</td>
<td>Public Servants</td>
</tr>
<tr>
<td>Ronald K. Jurgen 185</td>
<td>Guido E. Hilbert 270</td>
</tr>
<tr>
<td>Gilbert Wechsler 186</td>
<td>Edmond C. Buckley 273</td>
</tr>
<tr>
<td>Steven Ross 188</td>
<td>Berwyn F. Mattison 275</td>
</tr>
<tr>
<td>Educators 190</td>
<td>Meredith H. Thompson 277</td>
</tr>
<tr>
<td>Rear Adm. Norman M. Smith 190</td>
<td>Dean F. Peterson 280</td>
</tr>
<tr>
<td>William Gardner Van Note 192</td>
<td>Frank J. Devine 282</td>
</tr>
<tr>
<td>Dr. Ernest Notar 194</td>
<td>Charles W. Mathews 284</td>
</tr>
<tr>
<td>Ralph Carlisle Smith 195</td>
<td>Kirk R. Stetson 287</td>
</tr>
<tr>
<td>Henry J. Parcinski 197</td>
<td>Aerospace Personnel 289</td>
</tr>
<tr>
<td>Thomas Samuel Leary 199</td>
<td>R.Adm. Lewis B. Combs 290</td>
</tr>
<tr>
<td>Dr. Eduard Pestel 200</td>
<td>R.Adm. Mordecai Endicott 292</td>
</tr>
<tr>
<td>Thomas L. Martin 202</td>
<td>R.Adm. Harry H. Rousseau 292</td>
</tr>
<tr>
<td>Charles J. Merdinger 204</td>
<td>R.Adm. Frank T. Chambers 292</td>
</tr>
<tr>
<td>Hermann A. Haus 207</td>
<td>V.Adm. Jack Manning 292</td>
</tr>
<tr>
<td>Stephen Harris 210</td>
<td>V.Adm. J.J. Manning 292</td>
</tr>
<tr>
<td>Joseph J. Bulmer 212</td>
<td>R.Adm. L.B. Combs 292</td>
</tr>
<tr>
<td>Martin G. Abegg 214</td>
<td>R.Adm. A.C. Husband 292</td>
</tr>
<tr>
<td>Alumni Presidents 215</td>
<td>R.Adm. C.W. Parks 292</td>
</tr>
<tr>
<td>Livingston Houston 225</td>
<td>R.Adm. R.H. Meade 292</td>
</tr>
<tr>
<td>Officers of Associations 234</td>
<td>Comdr. A.D. Hunter 292</td>
</tr>
<tr>
<td>Clarence E. Davies 234</td>
<td>R.Adm. A.J. Fay 292</td>
</tr>
<tr>
<td>George R. Town 237</td>
<td>R.Adm. J.F. Jelley 292</td>
</tr>
<tr>
<td>Alexander Hassan 239</td>
<td>R.Adm. A.C. Husband 292</td>
</tr>
<tr>
<td>Robert J. Painter 241</td>
<td>R.Adm. J.V. Bartlett 292</td>
</tr>
<tr>
<td>Chauncey Starr 242</td>
<td>R.Adm. A.R. Marschall 292</td>
</tr>
<tr>
<td>Lois Graham 245</td>
<td>R.Adm. D.G. Iselin 292</td>
</tr>
<tr>
<td>Edward Epremian 248</td>
<td>R.Adm. K.P. Sears 292</td>
</tr>
<tr>
<td></td>
<td>R.Adm. W.P. Zobel 292</td>
</tr>
<tr>
<td></td>
<td>R.Adm. Kirby Smith 293</td>
</tr>
<tr>
<td></td>
<td>R.Adm. Henry G. Taylor 293</td>
</tr>
<tr>
<td></td>
<td>R.Adm. Gaylord Church 293</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (continued)

Admirals and Generals (cont'd)

- R.Adm. Henry F. Bruns 293
- R.Adm. James T. Matthews 293
- R.Adm. James D. Wilson 293
- R.Adm. C.C. Seabury 293
- R.Adm. C.L. Strain 293
- R.Adm. H.B. Jones 293
- R.Adm. William C. Church 293
- R.Adm. Lewis A. Hopkins 293
- Brig.Gen. F. Babcock 293
- Brig.Gen. Lester Higbee 293
- Brig.Gen. Roswell Hardy 293
- Maj.Gen. T.F. Farrell 293
- Maj.Gen. C.G. Holle 293
- Maj.Gen. E.C. Plank 293
- Maj.Gen. B.L. Robinson 293
- Maj.Gen. J.S. Seybold 293
- Brig.Gen. W.W. Bessell 293
- Brig.Gen. Art. McCullough 293
- Col. Donald J. Leehey 293
- Air Force Gen. J. Pauley 294

Successful People on Success 295

Appendix I 300

Appendix II 302

Index 304
THEY LED THE WAY

As a feature of Rensselaer's 100th Anniversary celebration, Dr. Ray Palmer Baker wrote a book titled *A Chapter In American Education*. In that book, Dr. Baker discussed the influence which Rensselaer graduates exerted upon the industrial growth of the United States. That growth was accompanied by and resulted from the rise of U. S. institutions of science, engineering and technology, many of which were founded by Rensselaer graduates or which contained departments and schools founded by Rensselaer graduates.

Now, a little more than a half century later, this present book has been written to portray the continuing and widening influence of Rensselaer graduates in a variety of professions in the United States and throughout the world.

Although Rensselaer's major educational emphasis continues to be in engineering, which enrolls about two-thirds of all students attending Rensselaer, a study of the Directory of Alumni published in 1972 indicates that only about one third of Rensselaer alumni are actually engaged in the practice of engineering. Many graduate engineers go into business or service industries in which their engineering or scientific educations prove to be helpful but not necessarily prerequisite.

Rensselaer's Schools of Architecture, Humanities, Management and Science as might be expected produce architects, writers and editors, managers and doctors, dentists, and scientists; but there are nearly 200 Rensselaer graduates who are
clergymen, over 400 who are lawyers, over a thousand in government services, nearly 1500 on college and university faculties. Thirteen Rensselaer graduates are, or have been, college presidents.

This book will attempt to give its readers an overview of some of the achievements of Rensselaer alumni. Time and human frailty prevent the making of an all-inclusive presentation. Thus it is necessary to sample and select so that even some outstanding accomplishments will not be dealt with. This book thus makes no pretense at being a kind of Rensselaer Hall of Fame. Rather, it attempts to show the scope and thrust of alumni achievements and the world-wide reach of Rensselaer's education.

The chapters following this one will deal with special kinds of expertise and accomplishments. See Appendix I for information on how the people discussed in this book were selected. This chapter in addition to serving as an introduction, presents some examples of that previously mentioned world-wide reach.

Let's start off by mentioning His Excellency the former Minister of Agriculture of the Government of Afghanistan, Mir Akbar Raza '53 Ch. E. Raza is the brother of the former Queen of Afghanistan and a direct descendant of Akbar, the founder of modern India. While at Rensselaer Raza was member of the soccer team, and he remained at Rensselaer a year after his graduation to take special graduate studies.

I believe that I have read, although not always as alertly as desirable, every one of the more than 32,000 entries in the alumni directory. It was not as tedious as it sounds because I was frequently making discoveries and coming across
little gems of information. Imagine my delight when I came across the following address - TSENG Chao-Feng 70 MS (Met E) BS (Naval Arch) P.O. Box No. 1-4 Lung-Tan, Taiwan (325) Republic of China 3. 1st Alley, 221st Lane Gin Hsin St., Chung Ho Hsiang, Taipai Hsien Taiwan. Gin Hsin - could someone have a wry sense of humor?

A casual leafing through the pages of the alumni directory revealed the following: an attorney employed by Magdelen College, Oxford, England; an engineer at the Ethiopian-Swedish Institute of Building Technology in Addis Ababa, Ethiopia; an electrical engineer with Hitachi of Japan; the President of a Health Food Company in the U.S.; a member of the Canadian National Research Council; an Astronaut; an Astrophysicist; a chief test engineer for the Israel Aircraft Industries; a Professor of Political Science at the University of Hawaii; the Roman Catholic Bishop of the Diocese of Los Angeles; the President of a U. S. company called Rings for Drums, Inc.; a self-employed Ph.D. who lists himself as a Goldsmith in Mexico City; the Technical Director of Air Algeria; the Secretary of the Club of Rome; a Professor of Architecture at Indonesia Institute of Technology; and the publisher of the European Book-of-the-Month Clubs. How far Amos Eaton's candle of enlightenment sheds its beams!

At Rensselaer's centennial, the symbol of alumni achievement was the Brooklyn Bridge. And Rensselaer alumni are still designing and building magnificent bridges as Milton Brumer's (23 ME, President of Amman and Whitney, Inc.) Verrazzano
Bridge amply demonstrates. But surely the modern symbol of alumni achievement can be seen nightly in the sky--the moon, Rensselaer's present president, George Low (48 BAE, MAE) headed that incomparable moon landing undertaking assisted by many other Rensselaer alumni, some of whom will be referred to in succeeding chapters.

A number of the key people who provided leadership for this landmark (better moonmark) accomplishment are listed in the alumni directory as Project Engineers. Now project engineers are a dime a dozen in that directory. Their work varies all the way from designing wind-up toys to designing the LEM, the craft for the moon landing. Yet many project engineers are contributing far more to human progress than the top officers of some industrial companies; but perforce in this book we'll be discussing many more top officers than project engineers. There is just no effective way to make a critical evaluation for the selection of some and for the omission of others. Since World War II and the development of the transistor, there has arisen a spate of new companies and new industries and new industrial and engineering leaders. By the time this book gets into print, other new industries and leaders will have loomed large on the ever-changing horizon. Thus as I write, this book becomes partially out of date. It is even difficult to identify and keep track of those emerging companies that are becoming increasingly important. I am sure we will overlook some incipient Texas Instruments - or Xerox-like companies. (I well remember the first gift to the Institute of Texas Instruments stock. Erik Jonsson, TI president, wrote, "I expect and hope that this stock will
increase in value, but then you should discount some of my optimism because I am so close to the company.")

Because Rensselaer awarded the first accredited doctoral degrees in Bio-Engineering, most of the departments of Bio-Engineering in other institutions have been established by Rensselaer graduates. This is similar to the early days of Rensselaer's history when it awarded the first degrees in Civil Engineering and the first degrees in science in the English-speaking world.

Hopefully one of the benefits of this book will be the encouragement of greater feedback from alumni who are pioneering new technological solutions and establishing new industries. Such feedback should be of great benefit to the designers of curricula for technological institutions of higher learning. As technological progress accelerates there is increased danger of what one writer has termed the Sabre-Tooth Tiger curriculum. He fancifully reported that long after the Sabre-Tooth Tiger had become extinct, elders in the various tribes continued to teach the young how to hunt Sabre-Tooth Tigers, arguing that what was good enough for their forefathers should be good enough for the youths and, besides, the principles of the teaching still remained valid even though the quarry no longer existed. The present generation of leaders brilliantly adapted such teaching to the conditions of their generation, and look at how well they were doing!

The Rensselaer catalogue of studies for 1871 listed as a fourth year course in Civil Engineering, a course in Stereotomony-Stone Cutting, theory and plates. When I arrived at Rensselaer
in the fall of 1929, that course was still being given, long after it had much useful application.

On the other hand, when students call for courses that are relevant, they often fail to understand that what is relevant today may be obsolescent tomorrow. Here thoughtful alumni who have kept abreast of their professions, can be of immense assistance to those who plan course and curricula in helping to lay out the bases for a sound technological education with emphasis upon those principles that they have found to stand the tests of time, coupled with examples of current practice and applications. The bite can be improved even though the sabre-teeth are missing.

The careers of alumni as indicated in this book may also provide some help to students in the formulation of their life goals. Many students seek someone to emulate. They want to follow someone who has gotten there. Alumni have reached such a wide variety of positions and places that the only difficulty for would-be emulators is the multitude of choices which lie before them. Perhaps the inspiration supplied by the careers described in this book will also help students over their low points and rough spots as they study and speculate about their future careers.

As we look over the careers of eminent Rensselaer alumni, we should keep in mind that most of those discussed in this book attended Rensselaer at a time when there was a bitter and often acrimonious debate taking place in the administrative and educational leadership of most technological institutions about the
wisdom of diluting their emphasis on their engineering curriculum by offering degrees in science, in architecture and in business administration. Courses in English, history, economics, psychology and foreign languages were tolerated only when they could be shown that they might be useful to an engineer in the practice of his profession.

Yet, as the careers of so many persons dealt with in this book demonstrate, graduates at Rensselaer and elsewhere rose above the limitations of an almost exclusively technical education to achieve distinction as leaders of business enterprises, as scientists, educators, writers and editors, as physicians, clergymen and, above all, as civic minded and compassionate citizens.

Truly the achievements of Rensselaer's alumni settled that debate and led the way toward its becoming a modern technological university. Today students look to Rensselaer not only for a professional education, but also for an education that will give them a greater understanding of the world, of themselves and of the best that has been thought and said by people throughout recorded history.

The Rensselaer Handbook of Information for 1910 provides a statement that well might be the theme of the following chapters and even of this present book: "...the Institution has the right to point with pride to the many names of alumni, young and old, who have become eminent in all branches of the profession (of engineering) and in business pursuits."
This book discusses the careers of 130 graduates of Rensselaer Polytechnic Institute. No claim is made that they are the 130 most prominent graduates although, judged by most standards, their careers have been successful and interesting. Appendix I indicates the method of their selection.

I have succeeded in having every living graduate whose career is discussed in the book, check what I have written about him or her for the accuracy of the facts, or I have used information that has been directly sent to me by the graduate.

In so doing, a few graduates did not send me confirmation of the information I had written about them, and thus I was forced to omit these graduates from the book. There comes a point where deadlines are inexorable.

I hope that readers will be as impressed as I was with the wide variety of services that Rensselaer graduates are rendering, and with the number of these services that are at the cutting edge of the graduate's profession.

In a book like this, there is always the danger of claiming too much credit for the institution, so that we must remind ourselves that quite a few other institutions can point with equal pride to similar achievements by their own graduates. It is a source of satisfaction, however, that Rensselaer graduates have been able to contribute so much to our civilization, so much to our knowledge, and so much to the application of
knowledge that benefits people everywhere.

I feel privileged to have been associated with these people, to have enjoyed their friendship, and to have watched their growth in ability, confidence and concern for others.

* To find the writeup of a particular graduate, see the Index.
They Led Industry

This Chapter deals with 13 Rensselaer alumni who have been outstanding in business pursuits. All of them have been chief executives of large companies. Of necessity, the distinction between alumni listed in this chapter and those listed in the professional categories, such as engineering, must be an arbitrary one. It is interesting to note that, although each of the following alumni had a distinctive and characteristic style of leadership, they appear to have two things in common—an unusual ability to analyze and get to the heart of a problem, and a great capacity for hard, sustained work. They truly exemplify the Rensselaer motto of "Knowledge and Thoroughness", and they also exemplify one other quality—a concern for the growth and safety of the people working under their leadership. They are presented chronologically, that is, in the order of their graduation from Rensselaer.

Sherrod Skinner graduated from Rensselaer in 1920. During World War I, he left his studies at Rensselaer to enlist in the submarine service. He was born in New Britain, Connecticut on October 19, 1896. He died in Chatham, Massachusetts, on November 28, 1978. From 1959 to 1961, he served as an executive vice president of the General Motors Corporation, a post for which he received the second largest salary paid to any person in the United States. His boss, the president of General Motors was, according to published figures, the highest salaried person.
Sherrod "Chuck" Skinner began his career with Landers, Frary, and Clark, an appliance manufacturer in New Britain, Connecticut, and he became Assistant General Manager of the company before leaving it in 1930 to join the Ternstedt Division of General Motors as chief engineer. This division manufactures automobile hardware. In 1935, he became general manager of Ternstedt, where he devoted himself to organization and simplification.

In 1940, "Chuck" was appointed General Manager of the Oldsmobile Division of General Motors. There, he devoted himself to engineering people, to fitting people into the kinds of jobs for which they were best suited. He also pioneered in the development of a new type of automation that would produce greater precision than had been achieved heretofore. The Oldsmobile 350 engine was a direct result of this interest. In addition, he insisted upon constant improvement of safety measures for his employees.

In 1948, he was honored by the disabled veterans' organization for his efforts in creating and making available a pleasure car which can be driven by wounded ex-servicemen who have lost the use of one or more limbs. At the time of the honor ceremony, more than 22,000 of the specially-made vehicles had been distributed.

By 1945, Sherrod Skinner had been made a vice president of General Motors and in 1951 he was named Group Vice President of the Accessory Group. In 1959, came his appointment as Executive Vice President in charge of automotive, body, assembly, parts and
defense systems. He retired from General Motors on October 31, 1961, following his 65th birthday. Then, from 1962 to 1969, he was Chairman of the Aerospace Corporation.

Mr. Skinner served as a Trustee of Rensselaer from 1940 to 1968. In 1960, he received the Honorary Degree of Doctor of Engineering from Rensselaer. During his service as a Trustee, he was active on key committees of the Board and he was Chairman of the Industrial Division of Rensselaer's fund raising efforts.

During World War II, he was on leave from General Motors to serve as Head of the Office of Production Scheduling, Office of Supply, the U. S. War Department.

Woodman Perine '31 and I were probably the last RPI officials to visit Chuck before his death. He was then in a nursing home recovering from the effects of a stroke and, during a period of remission, he was bored and welcomed guests. At the time of our visit, he was greatly interested in how President Low was getting along at RPI, and he told us that he had strongly recommended George Low to the Board of Trustees for RPI's presidency. He said as Chairman of the Aerospace Corporation he had worked closely with President Low in connection with work at NASA and had been greatly impressed by him.

When Woody Perine and I told "Chuck" that we were both driving GM cars that each had had over 100,000 miles of use, he remarked dryly, "That's too bad."

"Chuck" Skinner had a singleness of purpose and a tenacious memory. For him the world appeared in primary colors; he
recognized few shades or tints. A thing either was or it wasn't. Those of us who dealt with him soon learned that we had to do our homework before we talked with him about Rensselaer affairs. He had little patience with indecisive answers and, if one ever gave him an incorrect answer, that information remained with him despite our best efforts to correct it.

"Chuck" arrived on the campus one Friday afternoon, the day before a meeting of the Board of Trustees. I mentioned to him that he was in time to attend a dinner being given by the local Chapter of the American Society for Mechanical Engineering in honor of Professor Grant Palsgrove's 50th year of activity with that society. "I wouldn't walk across the street to honor that guy," Chuck replied. "He made me ineligible for the football team my senior year here."

One of the people "Chuck" visited first whenever he came to the campus was Emil Paige, custodian and general factotum of the '87 Gymnasium. "Paigie has more common sense and understanding of human nature than almost anyone I've ever met," he told me. "Many of my values and my sense of right and wrong and my desire to deal squarely with people have been influenced by Paigie. He is a fine human being." That's quite a tribute to "one of the least of these" from one of the most prominent.
Erik Jonsson '22 M.E. was one of the first four Americans elected to the Hall of Fame for Business Leadership (1975). But his leadership has not been limited to business. It has extended to education, to civic and community affairs, to engineering and to charitable enterprises.

Born in Brooklyn, New York, of naturalized Swedish parents, he is more associated with his adopted City of Dallas, Texas, than with his birthplace. From 1964 to 1971 he served as Mayor of Dallas. As a founder and leader of Texas Instruments, Incorporated, he played a key role in the development of microelectronics, the transistor and computer industries, and in the manner in which technologically-based companies are managed.

Erik had to work to put himself through Rensselaer, and he showed great ingenuity in finding paying jobs and in finding items to make and sell to his fellow students. He even had money left over to buy and operate a motorcycle, which he drove with verve and daring.

After graduating from Rensselaer, he went to work for the Aluminum Company of America, becoming manufacturing superintendent of the Aluminum Index Company, an ALCOA subsidiary. His association with Texas Instruments began with its predecessor, Geophysical Service Incorporated, of which in 1930 he became Superintendent of the Laboratory. In 1934, he was appointed Secretary of the company, and the company's operations were moved to Dallas. Before becoming President of Texas Instruments in 1951, he had held various other positions as a company officer. He became
Chairman of the Board in 1958, and Honorary Chairman in 1966. In 1978, Texas Instruments, Incorporated was the 112th largest industrial organization in the United States.

Erik Jonsson is presently Honorary Chairman of the Board of Trustees of Rensselaer. He once remarked, "I decided I'd stay young and refreshed by teaching young people but," he explained, "I couldn't think of anything I knew enough about to teach, so I decided to help those who did and could teach..." Just how well he has helped is evidenced by his Presidency of the Excellence in Education Foundation, his service as Chairman of the Educational Facilities Laboratories, which is now merged into the Academy for Educational Development, his former Chairmanship of the Board of Visitors of Tulane University, and his membership on the Visiting Committee of the Graduate School of Business, Harvard University. He is a former Trustee of Skidmore College and of Austin College, Texas. In recognition of his contributions to education and of his leadership in management, he has received eight honorary degrees.

Erik has also received numerous other honors. He is a member of the National Academy of Engineering, having been awarded its Founders Medal in 1974. He received the Gantt Medal in 1968 from the American Society of Mechanical Engineers and the American Management Association; the Hoover Medal in 1970 from the American Society of Civil Engineers; American Institute of Mining, Metallurgical and Petroleum Engineers; The American Society of Mechanical Engineers; and the Institute of Electrical and Electronic Engineers. In 1972, he was awarded the Chauncey Rose Medal from
the Rose-Hulman Institute of Technology.

Erik Jonsson has used his affiliation with civic, industrial and educational organizations and the honors which he has received from various segments of American professional and industrial life to help people in their daily work, in their interpersonal relationships, and in their striving to accomplish their aspirations. His "Goals for Dallas" perhaps best exemplifies what he has attempted to do for people. It is really an outgrowth of his leadership at Texas Instruments with its deliberate policy of goal-setting and managing through a systems approach to problem solving. Erik, in effect said to the people of Dallas, "What kind of a City do you want to live in and leave to your children as a heritage? What don't you like about the City now? How should we correct what you don't like, and what can you, yourself, do about it?"

He helped to establish a "Goals for Rensselaer" movement at a time when the various groups on the campus were noisily disagreeing with each other. And much of Rensselaer's present high morale and optimism for its future began with the discussion of "Goals for its Future."

The benefactions of Erik and Margaret Jonsson to Rensselaer are without parallel. They have contributed millions of dollars to buildings and programs, but equally as important as the dollars have been their contributions of themselves. Margaret has helped to make the campus present a modern and warm appearance; Erik has spent countless hours talking with students and faculty members, learning of their aspirations at first hand.
Erik has also personally and persistently persuaded others to give freely of their dollars to Rensselaer, being both a donor and a fund-raiser par excellence.

Erik Jonsson seldom missed a meeting of Rensselaer's Board of Trustees. And it is well that he didn't because his presence at Board Meetings has served both as a balance wheel and as a smoother of ruffled feathers. Whenever the debates began to heat up, Erik had a timely and appropriate story, usually about Texas, that let in a cool breeze of common sense. One time when the subject of costs was being debated, Erik remarked, "Speaking of high prices, reminds me of the Texan who complained to the telephone operator in Vermont of the high cost of making a phone call from Burlington to Bennington. "Ma'am," the Texan complained to the operator, "in Texas we can make a phone call to hell and back for two dollars and a half." The operator replied, "But that would be a local call, wouldn't it?"
When Vollmer W. Fries '24 E.E. left his position as Vice President of Manufacturing of White Motor Company in 1955 to become Chairman and Chief Executive Officer of White Sewing Machine Company, many of his Rensselaer friends wondered why he chose to leave a well-established and well-known manufacturer of trucks and heavy vehicles to head what Business Week once called "a pint-sized maker of sewing machines." Although bearing the same surname, there has been no connection between the two companies since they split back in 1916.

White Sewing Machine changed its name in 1964 to White Consolidated Industries. This "pint-sized" company in 1979 will, in round figures, do a two billion dollar gross annual sales, but it still prefers to keep out of the public eye. Soon after Vol Fries joined White Sewing Machine, it quietly began to acquire other companies and other divisions of companies. It now owns Blaw-Knox Company, the Bullard Company, a maker of machine tools, the Kelvinator Division, formerly owned by American Motors, Gibson and Easy Appliance Divisions, Franklin Appliance, White-Westinghouse Division, Frigidaire Division, and the Davidson Company, a maker of duplicating equipment. It was thwarted by the government in its attempts to take over Allis-Chalmers and White Motor Company.

Vol joined White Motor Company upon graduation from Rensselaer and during World War II served in the conservation division of the War Production Board and as a member of the W. Averill Harriman mission to Britain. In London he established international contacts that were to stand him in good stead years later when he became Chairman of White Consolidated Industries.
Mr. Fries was elected a Trustee of Rensselaer in 1950, and for many years served as Secretary of the Board of Trustees and a member of the Prudential (Executive) Committee. He also served as a Trustee of Penn College in Cleveland, which became the nucleus of Cleveland State University. He holds membership in many professional societies. He was a director of the Defense Orientation Conference Association, and he served as a member of the Hoover committee for the reorganization of the executive branch of the U. S. Government.

Active in fund raising for Rensselaer, he continues to serve as a valuable door-opener and ambassador. In order to bring eminent authorities to the Rensselaer campus, he has established the Vollmer Fries Lectureship Series in which eminent scholars come to the campus to meet with members of the faculty and with students, and to deliver significant lectures.
James M. Hait '28 is best known for his leadership of FMC Corporation. At the start of World War II, Food Machinery Corporation operated nine small machinery plants. Jim Hait suggested that the corporation develop an Amphibious Fighting Tank and Personnel Carrier. The prototype vehicle that was developed and built under his direction, in competition with the vehicles of many other companies won the approval of the Department of Defense, resulting in a business for FMC that eventually became seven times as large as its former operations. The Marines said of the vehicle nicknamed the "Water Buffalo", that it was the roughest and most unstoppable vehicle yet devised for war. Rear Admiral Cochrane, Chief of the Bureau of Ships said, "The victory of Saipan would never have been possible without the job done by the Navy's versatile and hard-hitting LVT's." The official designation for the "Buffalo" was LVT.

James M. Hait was born in Brooklyn, N.Y. in 1906. He graduated from Rensselaer with an M. E. degree in 1928. While at Rensselaer he was captain of the baseball team and the hockey team. He was president of his class and president of the "R" Club. His second son Paul apparently inherited some of his father's athletic prowess, winning a gold medal for swimming in the 1960 Olympics.

Jim spent his entire business and professional career with FMC and its predecessor company. He became a vice president of FMC in 1946; executive vice president in 1956; president 1960; and chairman of the board from 1966 until his retirement in 1971.

Rensselaer awarded James Hait the Honorary Degree of Doctor of Engineering in June 1962. He holds 64 patents for
various types of pumps, food processing and agricultural machinery, and amphibious vehicles. He is a member of the National Academy of Engineering. He has served as a member of advisory boards and councils for Santa Clara University, Stanford University, California Institute of Technology, and the National Industrial Conference Board.

His past and present directorships include the Pacific Gas and Electric Company, Wells Fargo Bank, Varian Associates, Georgia-Pacific Corporation, and Arthur D. Little, Inc.

For recreation, he enjoys the wide open-spaces, especially when he is engaged in hunting. He owns a ranch in Idaho and relishes battling the deep snows he encounters there. On April 19, 1971, more than 500 FMC employees gathered to give Jim Hait an affectionate send-off. Jim's career is a prime example of using one's engineering genius to produce a better-than-asked-for product. His associates described him as a tough but compassionate leader, driving himself harder than he ever drove others. They admired his creativity and ability to engender ingenuity in others, his ability to use engineering science for more practical and economical solutions, and for establishing a climate in which engineering is practiced in the true sense of the word.
Charles H. Rybolt '34 Ch.E. has been associated with the chemical industry since his graduation from Rensselaer. From 1934 to 1941, he served as an engineer with the Crystal Tissue Company of Middletown, Ohio. In 1941 he joined Wallace and Tiernan Company as a field engineer in Pensacola, Florida. He then held various supervisory engineering positions with that company until becoming Vice President of the company's Chemical Division in 1958. He was elected President and Chief Executive officer of Wallace and Tiernan in 1965, serving in that capacity until he became President and Chief Administrative Officer of Pennwalt, the company which resulted from the merger of Wallace and Tiernan and Pennsylvania Salt and Chemical Company. He retired from Pennwalt in 1971.

Active in RPI Alumni Affairs since his graduation, Charles Rybolt served as Chairman of the 1957 Alumni Mid-Winter Reunion in Buffalo. Charlie credits his success with his ability to communicate with people at all levels and to being in the right place at the right time. One of the features of the Mid-Winter Reunion in Buffalo was an alumni luncheon in a hotel dining room in Niagara Falls, Canada, that reputedly had an excellent view of the Falls. Unfortunately, when the luncheon was held, there was a dense fog over the entire countryside. Charlie's ability to turn failure into success, however, rose to the occasion. He asked the diners to take out a white handkerchief and hold it before their eyes. Then he said, "I want you to remember that this was your spectacular view of Niagara Falls. You can show anyone what the Falls looked like today by holding
In 1967 Mr. Rybott was elected a Trustee of Rensselaer, and he has served on the Board ever since. Active in many local and professional societies, he has been a Vice President of the Manufacturing Chemists Association.

In addition to his service as a Trustee of Rensselaer, he served as Vice Chairman of the Rensselaer Fund in 1967 and 1968, and he has held a variety of leadership positions in the Rensselaer Development Council. His modesty, wit and unassuming manner make it difficult for his friends at Rensselaer to realize the extent of his responsibilities and accomplishments. There may have been some indication of Charlie's future professional success while he was still a student at Rensselaer because he was elected to both Tau Beta Pi and Sigma Xi. High grades and the ability to communicate do not necessarily guarantee that one will become a success in management or a profession, but they are certainly two important factors that appear in many successful careers.
A story in the Business section of the *New York Times* for Monday, March 29, 1979 began as follows: "Vice President Mondale was at his left, Prime Minister Menachem Begin of Israel was at his right, and the man in the middle of yesterday's elegant luncheon table at Manhattan's Plaza Hotel was Augustine R. Marusi, 36, B.Ch.E., chairman of Borden Inc." Six days previously Mr. Marusi had attended the Washington dinner of President Carter and President Anwar el-Sadat of Egypt. As Chairman of the Israel-United States Business Council, Mr. Marusi stated that Israel "given an environment of stability and peace, could become an engine of prosperity not only for the Israeli people, but also for the Egyptian people and hopefully for all the people of the Middle East."

This is pretty heady stuff for a fellow, who according to his own account, graduated from Rensselaer in 1936 at the bottom of his Chemical Engineering class. He joined Borden three years after his graduation and, except for a four-year stint as the commander of a mine sweeper in the Pacific during World War II, he has been with Borden ever since. Augie Marusi's first job with Borden was in the research department of the Borden Chemical Division. In 1954 he was named President of Borden Chemical. In 1964 he was elected Executive Vice President of the parent company, becoming President of Borden, Inc. in 1967, assuming the additional post of Chairman of the Board in 1968. He was the first chief executive of Borden, Inc. who had not had a background in the dairy business. Dairy operations now contribute less than one quarter of Borden's operating income, and Elsie, the Borden cow, has gone
into corporate eclipse. Yet Borden is still the second largest dairy company in the United States.

What many people are not aware of is that Borden is also the fifth largest food company in the country, and it is believed to market a wider variety of food products than any other company—things such as Aunt Jane's pickles and relishes, Wyler's dry soups, beverage mixes, Calo dog and cat food, Cracker Jacks, Drake's cakes, ReaLemon juices, Sacramento tomato juice and Wise potato chips. Borden's is also the 17th largest chemical producer. It has a fleet of clam diggers and a fleet of shrimp boats. So as Elsie fades into the background, Elmer moves toward center stage, and Borden is stuck with him so to speak.

Mr. Marusi received an honorary doctor of engineering degree from Rensselaer in 1963; and an honorary doctor of laws degree from Capital University, Columbus, Ohio, in 1973. He received the 1976 Brotherhood Award of the National Conference of Christians and Jews. In June 1978, Mr. Marusi was awarded the Prime Minister's Medal, the highest civilian award given by the State of Israel.

The following quotations illustrate some of his ideas about the role of the chief executive. "...Classically there has been very little democracy in the business world and company presidents have pretty much built their firms around their own ideas and those of the echelons below them. "....I try to provide an atmosphere conducive to good communications so that the good methods in one area can be applied to other fields, and so that mistakes can be caught faster. "...Men grow and mature on
the job, and school is fine as a supplement. "You can accomplish a lot in the training process by doing the right thing yourself and thereby convincing trainees that the company is doing the right thing, but 'the right thing' is hard to define. It has moral and ethical overtones. Basically, it is an atmosphere which encourages personal growth and development."

When asked to what he attributed his success, Mr. Marusi wrote: "If ever there was a man that I like to recall in times of stress or ease, it is Professor Lewis G. Coonley of Rensselaer. He had the talent to make one feel that accomplishment is a matter of hard work applied consistently."
When George A. Strichman graduated from Rensselaer in 1937 with the degree of B.Ch.E., he had no idea that someday he might be referred to as a tycoon, the definition of which is "a businessman with wealth and power." But Forbes magazine for May 1978 listed George Strichman as receiving the 21st highest remuneration of 795 big-company chief executives, ahead of the executives of such well-known companies such as H. J. Heinz, Coca-Cola, and Xerox.

When a reporter asked him recently if he had thought when he left RPI in 1937 that he'd get where he is today, he replied, "Hell, no, I just wanted to be a good engineer in those days. And I was a pretty good engineer." He was such a good engineer in fact, that he became the director of manufacturing for G.E.'s small aircraft engine department. Then he served as operations manager for the Sea Wolf project, the first nuclear submarine that was powered by a sodium-cooled reactor. After serving as director of manufacturing for Raytheon Company, Mr. Strichman became, in 1959, President of ITT Kellogg Division of International Telephone and Telegraph Corporation. In 1962, he joined Colt Industries as President and Chief Executive Officer. Within four months, he was elected to serve also as Chairman of the Board.

In reply to a question about how to succeed in industry, George replied as follows (the reply has been abbreviated somewhat, but the words are his own): "My engineering education and background, I believe stood me in good stead. There is a realism
and a pragmatism to the engineer's outlook that I believe are distinct assets to the management function....It was not until I made the decision (in my late thirties) that I wanted to manage a large enterprise, that my real management career started. I had to develop the management skills required and to increase my awareness, knowledge and understanding of what was going on around me, and how it affected the job at hand....While I am intrigued by the frequency with which careers are affected by circumstances over which the individuals seem to have little control, I am convinced that a career goal, and the determination to achieve it, can have a great deal to do with making the luck to which career success is so often attributed. And perhaps the most important of all is to enjoy and derive a large measure of personal satisfaction from what one is doing."

George Strichman grew up in Schenectady, where his parents still live. His matriculating at Rensselaer was preceded by what he recalls as an enjoyable childhood and young manhood. "There were lots of things to do, including trips to Lake George. There were the Boy Scouts and tennis and cross country. At RPI, he was member of the tennis team. George has been a trustee of Rensselaer for about nine years and, during that time, he has seen important changes in his Alma Mater. "Truly," he says, "it is a much better school than when I went to it."
Under the leadership of William D. Stevens, B.M.E. '40 Foster Wheeler Corporation has missed an initial shipping date only once in the past ten years. To him schedules are sacred. (Shades of Clay Bedford!) "One of our moves in this area," he stated, "was to set up a two-shift, five-day production schedule. If we get into trouble on a particular job, we have the opportunity to go to a third shift or to the sixth day to pull ourselves out of the hole."

Bill Stevens is a man for the present age, having spent his entire professional life - with three years out for Navy duty - in the energy business. After he graduated from Rensselaer in 1940 with a B.M.E., he joined Babcock and Wilcox as a service engineer. In 1962, he went to Foster Wheeler as head of its steam department. He then proceeded up through the ranks to the post of Executive Vice President in 1974. In 1977, he was elected Chairman of the Board.

Although Foster Wheeler has a thriving export market, its primary business is the domestic utility boiler market where it currently has about 20% of that business. "We'd like to see it expand to 25% or even 30%," he says, "but we don't feel pressed to achieve a dramatic increase."

Commercial coal gasification plants have been talked about as a partial solution to the present energy crisis, but Stevens thinks that coal gasification will be limited to home heating rather than for power boiler fuel. "Gas from coal," he says, "will simply be too valuable to burn in commercial boilers."
Bill Stevens is a believer in inspirational leadership. "Without it you are likely to fall flat," he says. "I think it necessary to convince people at all levels of the organization that they can contribute, and that the company is going somewhere with their help...We try to convince our employees that the ideas they contribute have value and that we will listen to them."

Like many business leaders, he is active in professional and community affairs, and like so many successful Rensselaer graduates he was a member of both Tau Beta Phi and Sigma Xi while a student at Rensselaer.
Walter A. Fallon, M.S. '41, Chairman of the Board of Eastman Kodak Company stated, "I think we all owe much to Rensselaer, a school that made so many correct decisions about academic standards, curricula, and educational emphasis. I know I do." His advice to graduates entering the professional world is: "Never duck a challenging assignment and never shy away from hard decisions. Accept the element of risk or sacrifice, and recognize challenge when it is offered. Take challenge seriously, perform beyond expectations, and make yourself ready for the next opportunity. Finally, recognize that every company sponsors competition among peers. The 'system' is designed to find and reward competitors, passing by those who choose to 'drop out' of the competition."

Mr. Fallon's career is an example of the application of this advice. He began his career in 1941 with Kodak as a chemist in the Film Testing Division in Rochester, N.Y. In 1944, he transferred to Oak Ridge, Tennessee, and held positions as chemist, general foreman, and assistant superintendent successively. From 1955 to 1970, he moved to positions of increasing responsibility, becoming manager a year later. In 1970, he was elected a vice president and a member of the general management staff of the company. On May 18, 1972, Walter Fallon was elected President and Chief Executive of the company. Effective January 1, 1977, he was elected Chairman of the Board of Directors and Chairman of the Eastman Kodak Executive Committee. He continues as Chief Executive Officer.

He received a B.S. degree in chemistry from Union College and an M.S. degree in chemistry from Rensselaer. Union College
awarded him the honorary degree of Doctor of Science in 1972, and
Nazareth College of Rochester awarded him the honorary degree of
Doctor of Laws in 1978. In 1979, Mr. Fallon received the honorary
degree of Doctor of Science from Rensselaer.

In 1968, he was the recipient of the Herbert T. Kalmus
Gold Medal Award from the Society of Motion Picture and Television
Engineers. In 1974, The Carborundum Company presented him with
its annual Award for Excellence for his contributions to the chem-
icals industry. In 1977, he received the "Man of the Year" Award
from the Photographic Manufacturers and Distributors Association.

For Mr. Fallon, photography is a hobby as well as a
life-long career. Typically, he makes pictures with a Kodak pocket
Instamatic camera though he occasionally uses other types "to see
where the competition is."
No matter what make of U. S. automobile you own, the chances are that its seats were manufactured by a company headed by John F. Daly, RPI '43 M.E. He is Chairman of the Board of Hoover Universal, Inc., and his company is the largest manufacturer of auto seating in the United States.

John Daly served in the Air Force from 1942 to 1945. Returning to civilian life, his employment was running a punch press before he started making his way up the manufacturing industry's administrative ladder. He worked successively for Hardie Manufacturing Company, International Steel Corporation, and Universal Wire Spring Company before becoming president of Hoover Ball and Bearing Company in 1968. The company name was changed in January of 1978.

Hoover was once a major supplier of bearings and fabricated steel. It has now turned to light metals and plastics to meet the demand of the automobile industry for lighter weight materials. The company not only manufactures plastic products but it also makes the machinery to produce plastics, thus furnishing its competition with the wherewithal to compete.

As the automobile companies continue to reduce the weights of their vehicles, Chairman Daly sees increasing opportunities for innovative suppliers to that industry. Hoover, for instance, now actually molds metal components in combination with urethane foam to form seats that are complete units. "What we make," Daly explains, "are assemblies of metal and molded urethane foam pads. We are experimenting with structural foam and other new and imaginative uses of light materials. We have only seen
the beginning of design changes in the automobile business. I see that as a great opportunity, and I'm very optimistic."

John Daly pointed out that pound for pound U. S. cars are still less expensive than cars anywhere else in the world. He is not as worried about high gasoline prices as most people, explaining that steel prices have gone from eight cents a pound to thirteen cents a pound, or percentage-wise about the same increase as gasoline.

Remember the next time you take a back seat that it almost certainly will have been made by John Daly's company, Hoover Universal, Inc., which doesn't intend to take a back seat to anyone.
In 1974 Stanley I. Landgraf, B. Met. '46, B. Mgt. '47 became the first person to head Mohawk Carpet Company who was not a member of its founding family. It was founded in 1878. Mohawk Carpet had earlier changed its name to Mohasco Industries Inc. In 1974 when Landgraf became president, it adopted the name Mohasco Corporation. Starting as a small carpet company, it grew until it became one of the major companies in the carpet industry. In the 1960's it acquired nine small furniture companies and nine home furnishing distributors. Carpets now constitute less than one quarter of Mohasco's total sales--$700 million plus.

Mohasco operates in four sectors of the economy, carpeting, furniture, distribution and furniture rental, in each of which it plays a prominent role. Mohasco employs over 16,000 people, operating through six domestic and two Mexican carpet manufacturing facilities, 19 domestic and two French furniture facilities, 46 distribution centers and 64 furniture rental showrooms and warehouses.

The Company's product lines are well known by many in the RPI family including, as they do, Mohawk, Alexander Smith and Firth carpets, Barcalounger and Stratolounger, reclining chairs and sofa sleepers and Stratford, Chromcraft, Liberty, Monarch, Peters-Revington and Trend Line furniture. Its furniture rental operations are conducted under the name of Cort Furniture Rental. This sector of its operations is growing rapidly because of the increased mobility of rising young business executives. These executives prefer to travel light, renting both apartments and furniture.
Stanley Landgraf has been with Mohasco ever since his graduation from Rensselaer. Starting as an industrial engineer, he proceeded through the ranks to the presidency of the corporation in April 1978. He is a Trustee of Rensselaer and a member of the Board of Directors of the Saratoga Performing Arts Center. He served in the U. S. Navy from 1943 to 1946.

Mr. Landgraf credits his success with learning at an early age to relate to people, having worked with his family in a small business while he was attending school. He also believes that the amount of homework he was forced to do at RPI and the constant testing, the comprehensive high level of work activity helped to prepare him for his career. He says that while he was a student, he thought that RPI made excessive demands upon his time but as he looks back on it, it was the best thing that could have happened to him. He states that one of his sons has just graduated from Rensselaer and that, according to the son, RPI's work load and quality continue to stay as high as it was when he was at the Institute.
Tennyson's Ulysses declares, "For my purpose holds to sail beyond the sunset and the baths of all the Western stars..."

Having played a key leadership role in NASA's automated lunar and planetary programs including the Mariner, Ranger, Surveyor and Viking projects which made successful flights to the Moon, Mars and Venus, Edgar M. Cortright '47 has come as near as anyone to fulfilling Ulysses' ambition.

Cortright is presently President of the Lockheed-California Company, a division of the Lockheed Corporation. Prior to his election to that position, he served as Senior Vice President of the Lockheed Corporation in charge of its Science and Engineering activities.

Edgar Cortright received his Bachelor's degree in Aeronautical Engineering from RPI in 1947 and his Master of Aeronautical Engineering degree from RPI in 1949. Subsequently he received the honorary degree of Doctor of Science from George Washington University and the Honorary Doctor of Engineering degree from RPI.

From 1948 to 1958 he worked at the Lewis Research Center, Cleveland, Ohio; from 1958 to 1968 he was at NASA Headquarters in Washington, D. C. Initially, he was a member of a team of scientists and engineers that developed the programs and operating concepts of the National Space Agency (NASA). In 1958, as Chief of Advanced Technology in NASA Headquarters, he assumed direct responsibility for the development and operation of the nation's first meteorological satellite programs, Tiros and Nimbus.

In February 1960 he became Assistant Director for lunar and planetary programs in the office of Space Flight Programs.
Within the next few years he advanced to the position of Deputy Associate Administrator for Space Sciences and Applications, where he was, in effect, general manager at all of NASA's unmanned space flight programs. In October 1967 he joined the Office of Manned Space Flight in NASA Headquarters as Deputy Associate Administrator.

From 1968 to 1975 he served as Director of NASA's Langley Research Center. This Center managed a number of aeronautical and space flight projects, including Viking, designed to land two spacecraft on Mars in 1976. In addition, under his direction the Center conducted a broad research and development program for the advancement of science and the technology of flight.

In 1966 he was awarded the NASA Medal for Outstanding Leadership and in both 1967 and 1977, the NASA Medal for Distinguished Service. He is a member of the National Academy of Engineering and a former President of the American Institute of Aeronautics and Astronautics. Like so many other persons discussed in this book, while at RPI he was elected to membership in both Sigma Xi and Tau Beta Pi.

When asked to what he attributed his success, he replied, "I entered aeronautical engineering at a most propitious time, namely, at the onset of supersonic flight. Ten years later I again had an opportunity to be a pioneer--this time in space. In both cases I was associated with an outstanding group of men and women who helped and inspired me to do my best. In the case of space, we had a magnificent opportunity to carry out really stupendous undertakings. The equivalent may not occur again in my lifetime--although it should in the field of energy!"
When he was asked what advice he would give to young people today who were about to enter his field, he replied, "I would certainly urge young graduates to be willing to undertake jobs that they are not really certain they can perform...After thirty years of being in positions like this, I can say with some authority that most of us can do a little better than we think we can, and we should always set our personal goals accordingly."
William R. Haselton '49 B.Ch.E. is President and Chief Executive Officer of St. Regis Paper Company. His education at Rensselaer was interrupted by three years' service in the U. S. Naval Reserve. After graduating from Rensselaer, he took advanced work at Lawrence College, (The Institute of Paper Chemistry), where he earned both a master's and a doctor's degree in chemistry—the latter in 1953. Upon receiving his doctorate, he joined the Rhinelander Paper Division of St. Regis Paper Company. In 1958 he became Vice President and General Manager of Rhinelander Paper.

From 1961 to 1969 he served as Vice President and General Manager in charge of St. Regis' Washington State area operations. Here he also served as President of R-W Paper Company owned jointly by St. Regis and Weyerhaeuser Companies. In 1979 he was promoted to Senior Vice President in charge of St. Regis pulp, paper, forestry and land management group.

He became Executive Vice President of St. Regis Paper Company in 1971, President in 1973 and Chief Executive Officer in 1979. He is also a Director of St. Regis and Allendale Insurance Company.

In 1953 he was the recipient of the Westbrook Steele Award for paper chemistry. Although Mr. Haselton's Company is a major contributor to the wastebaskets of the United States, you can be sure that if anything memorable is written on St. Regis paper it will be preserved for posterity. St. Regis Paper Company is one of the 150 largest companies in the United States, and it ranks among the top 100 companies in net income.
Companies With Special Ties to Rensselaer

Although there has been a tradition of Rensselaer graduates at or near the top of many corporations, two companies in particular illustrate this tradition. They are the General Electric Company, which is one of the three largest employers of Rensselaer graduates, and the Chicago Bridge and Iron Company, which in the past has been headed by three Rensselaer graduates. General Electric employs more graduates from Rensselaer than from any other college.
About Robert Paxton '23, the 1923 Transit said, "Robert's most outstanding characteristic is his advance knowledge of all the subjects we study. He is already consulting engineer of the class." Throughout his entire life Bob Paxton always seemed to have been prepared for opportunities. Born in Scotland, he came to the United States with his parents at the age of two. His father was a carpenter who was employed at the Watervliet Arsenal. The Paxtons lived on Stow Avenue. To reach the Arsenal in winter, Bob's father used to take a short-cut over the ice of the Hudson River. One day he saw a man break through the ice and his father, at considerable risk to himself, succeeded in rescuing him. This act of heroism received so much publicity that it came to the attention of the Carnegie Hero Fund and an award of $1000 was given to his father. It was this award that enabled Bob to attend RPI.

Bob stated, "I wanted to be an electrical engineer above everything. But it was an ambition I didn't ever think I could realize because of my family's financial condition. Although there wasn't much hope of college, I wanted to get as much as possible out of high school not only for use in later life regardless, but also to be prepared for college if the chance ever came."

Upon graduation Robert Paxton went to work for the General Electric Company. In 1932 he became Managing Engineer of the Panel Division, and in 1941 he was named Manager of the Philadelphia Plant. In 1945 he became Manager of the Pittsfield, Massachusetts plant. During this time, he was awarded twelve patents in the field of switchgear and control.
In 1950 he was promoted to a Vice President of General Electric and in 1951 he became an Executive Vice President. Bob succeeded Ralph Cordinier as President of General Electric when Mr. Cordinier became Chairman of the Board in 1958. After a serious operation in 1960, it became clear to Bob that a long period of recovery lay ahead with no possibility of his carrying out his normal duties to his own satisfaction. He thus requested and was granted retirement in 1960.

As an executive who has been in charge of thousands of people, Bob believes that from 75 to 90 percent of an executive's time should be devoted to human relations. He patiently explained to everyone with whom he worked, the mutuality of interest between employer and employee. He stated, "While I am sometimes doubtful of the wisdom of some of the national unions, particularly on economic matters, it would be unfair to the unions with which I have dealt, if I did not point out that in the vast majority of cases, after mutual dispassionate appraisal of the facts, agreement and understanding often follow. There are times when our viewpoints are substantially opposed, such occasions arising much more often because of inability to secure facts than from basic differences in philosophy. Among the representatives of the unions with which I have dealt, I can think of none with whom I would not willingly continue association, and I can think of so many whose honesty, fairness and intelligence I admire."

Regarding General Electric's slogan of "More goods for more people at less cost," Bob explains, "It means more production requiring more employees supplying more customers through greater
productivity as a result of better planning, better methods, better utilization of materials and an honest day's work for all. It is a formula for stability. It is sound economics. It is the only plan that has ever worked."

Throughout his busy career Bob Paxton maintained an active and loyal association with Rensselaer. He served as Alumni Trustee from 1946 to 1951, at which time he became a life trustee. In 1951 he was also president of the national Rensselaer Alumni Association. He served on the Development Council from 1952 to 1960. In 1958 Rensselaer conferred upon him the honorary degree of Doctor of Engineering.

Bob Paxton died in 1980.
Otto Klima, Jr. '44 B.A.E. as Vice President and General Manager of General Electric's Re-Entry and Environmental Systems Division is typical of the new breed of engineering executives. As he says of his own career, "I was positioned opportunely to share in the programs to land man on the moon and to probe the outer planets. Being in the right place at the right time was very important in my career."

Mr. Klima personally contributed to the design of every re-entry system developed by his company from the first successful payload re-entry of the Discoverer through the Thor, Atlas and Titan re-entry systems. Furthermore, his Division never missed an operational date for a re-entry system, and they were an integral part of approximately 900 flights with a 98% success ratio. Since 1955 his Division has maintained an overall cost variance of 2.9% on about 2.4 billion dollars worth of business!

In addition to directing programs in the advancement of space technology, Otto Klima has been looking ahead to the application of space technology to nonspace applications to meet growing needs in such areas as pure air, pure water, cheaper and effective housing materials and ocean research. Some innovative structures and materials are already about to be marketed that result directly from aerospace research. These are: precast plaster walls that can be transported without cracking; stiff floors that are only five inches thick, made of a honeycomb of paper sandwiched between plywood; and a roof of silicone and chipped stone. All of these innovations give architects greater design freedom and home buyers more attractive houses at the same
or lower costs than conventional houses, and considerably less expense for upkeep and repair. Here is at least part of the answer to the question, "What are we spending all that money on space for?"

Mr. Klima represents the American Institute of Aeronautics and Astronautics on the Award Committee of the Daniel Guggenheim Medal Board of Award Committee. He is a trustee of the Bioenergy Council and a member of the Sea-Space Symposium. He is also a member of the National Advisory Committee on Oceans and Atmosphere. Additionally he is a member of Widner College's Society for Advancement of Management and a member of the Board of Directors of the West Philadelphia Corporation.
Donald E. Debacher '51 Ch.E. is right back where he started from. "I'm only a mile from where I first started with General Electric Company 20 years ago." And he's not much further away from where he lived as a young man. That is only a short walk from what is now General Electric Plastics Division worldwide headquarters.

Since joining General Electric in 1955, Debacher has progressed steadily through the ranks of its Plastics Division. He has been involved in the development and expansion of use of many plastic products, particularly LEXAN. Early in his career he supervised the Pittsfield polycarbonate plant operation and contributed to the new process technology for Lexan.

In 1962 he was transferred to Mount Vernon, Indiana, where he held positions as process development specialist, advanced engineering manager and shop operations manager. In 1968 he became the Mount Vernon Plant Manager. Then in 1970 he returned to Pittsfield as head of the Lexan products section. In 1973 he headed General Electric's silicone products department in Waterford, New York, returning to Pittsfield in 1974 as General Manager of the Plastics Business Division. In 1975 he was named a Vice President of the Company.

In 1963 he won the Cordiner Award for his role in designing the first major expansion of the Mount Vernon Lexan resin plant. It in turn received designation by Factory magazine as one of the "Top Ten Plants" in the United States.

Donald Debacher likes to play golf, and has an eight handicap. At Pittsfield High School he won the Tommy Curtin Award
as the top scholar-athlete in the Class of 1947. He played football, was on the track team and was a skier. Ironically he points out that he wasn't hired by General Electric the first time he applied for a job. In Pittsfield he's a local boy through and through, having first met his wife at the Crane Elementary School there.
Thomas Romanach '41 B.E.E. in 1961 received the most significant decoration the Brazilian Government awards foreign citizens for relevant work done on behalf of the country: the "Ordem do Cruzeiro do Sul." At the time of that award he was Director and General Manager Consumer Goods Department General Electric do Brasil. In 1963 he was named President and General Manager of General Electric de Mexico S. A. Then in 1966 he was named President of General Electric do Brasil S. A., his present position.

Upon graduating from Rensselaer, Tom started with General Electric in its "Test Program." He joined International General Electric the following year. After holding various assignments in New York and Washington, he was transferred to Sao Paulo, Brazil, as Sales Engineer.

In addition to his duties with General Electric, he has been active in numerous civic and national activities. He has been President of the American Chamber of Commerce for Brazil - Sao Paulo and of the National Association of American Chambers of Commerce in Brazil. He has also served as an officer and director of the Rotary Club of Sao Paulo.

Tom credits Professor Stanley Wiltse for having interested him in a career with General Electric Company. Because his wife was a native Brazilian, Thomas Romanach elected to remain in Brazil despite General Electric's desire to give him wider responsibilities. He says, "Everything considered, I am sure I made the right decision." He also states that probably by the time this book is published he will have retired.
Nancy DeLoye Fitzroy '49 B.Ch.E. is Whirly Girl No. 73. This is her designation in the International Association of Women Helicopter Pilots. And she qualified for her commercial license in helicopters before she got her single and multi-engine fixed wing aircraft commercial license!

As a Program Development Manager for the General Electric Company, Nancy occupies an important position. She has the functional responsibility to analyze and appraise the competitiveness of the products of the General Electric Gas Turbine Division. She studies and evaluates and recommends the Division position on policies and issues that affect the product offering and the profitability of the Division. She develops and recommends plans for externally-funded programs.

Nancy says she was "always the one they would call on when they had a knotty problem in heat transfer." She has served as a member of the Board on Engineering Manpower and Educational Policy for the National Academy of Engineering, and has served as Chairman of the National Science Foundation's Task Group on Industry-University Interaction. She has also served as a member of the National Science Foundation's Advisory Group on Research.

In 1972 Nancy Fitzroy was the recipient of the "Society of Women Engineers" Achievement Award. Nine years earlier in 1963 she was the first woman in the history of the American Society of Mechanical Engineers to be elected Chairman of a Section. (The Hudson-Mohawk Section.) In 1976 she was featured in the April issue of Cosmopolitan Magazine. Cosmopolitan quoted her as saying, "The difficult days for women engineers are over...The field is
wide open."

About her success as an engineer and as a manager, Nancy says, "I've always had a chance to learn about new things, so I was on a steep learning curve. That was what really kept me going." When asked what she thought of her future, she replied, "I'm definitely interested in future growth and I will evaluate each opportunity as it comes along."

Nancy Fitzroy has written extensively about the opportunities for women in the engineering profession, and she is in great demand as a speaker on both technical and non-technical subjects. She has published nine articles in national magazines, over 150 company technical reports and five articles in Guidance Publications. She also holds three patents.

In 1978 Nancy Fitzroy was elected a Fellow of the American Society of Mechanical Engineers, and in 1975 she was awarded a Demers Medal by the Rensselaer Alumni Association.

What is her advice to girls who wish to enter the engineering profession? "A young woman should not expect lots of glamour and boys because that is not the way it is. I'm a hard-working engineer, but it took something silly like flying the helicopter to get invited to the White House for tea."
In his position as Staff-Executive and Chief Technologist of General Electric's Power Systems Sector, Thomas H. Lee '54 Ph.D. serves as a combination Chief Scientist and Chief Engineer. He is an expert on advanced energy systems and on electric power generation, transmission and control. Particularly notable has been his earlier work on the development of switchgear equipment.

Shortly after receiving his doctor's degree from Rensselaer, Thomas Lee brought to a successful conclusion the development of high vacuum interrupters. Ever since Miliken and Sorenson developed this concept in 1924, industries all over the world had been baffled in their attempts to build such a device. Now practically every manufacturer of this device is a General Electric licensee.

Thomas Lee has also pioneered in the development of plasma physics research and the development of power semiconductors. He also leads a group of researchers who are studying ways of applying electronics to the Power Systems business. Their work consists of research and development of relays, load management, automatic meter reading, systems automation, computer-aided design and computer-aided manufacturing.

Mr. Lee is a graduate of the National Chiao Tung University, Shanghai, China. He also holds a master's degree in Electrical Engineering from Union College. In 1954-55 he served as Adjunct Professor at Rensselaer, and has since served as a lecturer at the University of Pennsylvania and Lehigh University. He has served on the Visiting Committees of the previously mentioned
institutions and of the University of Texas, Worcester Polytechnic Institute and Syracuse University.

He is a member of the National Academy of Engineering, Sigma Xi, and in 1974-75 he served as President of the Power Engineering Society. In 1975-77 he served as Chairman of the IEEE Energy Committee. He also served as Expert Advisor and Member of the International Conference on Large Power Systems. He is the author of one book, Physics and Engineering of High Power Switching Systems (1975) and of 63 papers that have appeared in professional journals. He holds 30 patents.

In 1962 he won the Annual Achievement Award of the Chinese Institute of Engineers and, in 1975 he won the Achievement Award of the Chinese Engineers and Scientists of Southern California. In 1976 he won the Meritorious Award of the Power Engineering Society. He has also won five IEEE Awards and four General Electric Managerial Awards.

All of us have come to expect a continuous, uninterrupted and adequate supply of electricity at all times, and it is only when we reflect upon the accomplishments of people like Thomas Lee that we realize how much we depend upon their research and knowledge for the bountiful power we have at our command at the flick of a switch.
Three Rensselaer graduates have played key roles in the development of Chicago Bridge and Iron Company. They are George Terry Horton, who served as President of the Company from 1912 to 1945, Harry J. Clarke, President from 1962 to 1968 and John T. Horton, President from 1968 to 1969.

George T. Horton was an unusual person, having an original mind and a questioning attitude. His motto was, "Whatever is, is wrong." As new inventions appeared, he investigated them to determine whether they offered any clue that would aid Chicago Bridge and Iron to pioneer and develop new ways of doing things. Under his guidance the company developed the basic concept of forming plates into doubly-curved surfaces and electric welding for construction, enabling it to build larger and lighter structures. The Hortonsphere, a new concept in the storage of liquids and gasses, is a monument to his genius. During World War II, George Horton helped the U. S. Navy construct floating drydocks an important element in the Navy's success in the Pacific Ocean.

George Horton served as a Trustee of Rensselaer from 1925 until his death in 1945. During that time he was instrumental in the establishment of Rensselaer's Metallurgy Department, donating a welding laboratory to the Institute. He served as President of the Rensselaer Alumni Association from 1933 to 1934. Interested in aviation almost from its inception, he donated an airplane to Rensselaer. He established a number of scholarships--now 18 undergraduate and one graduate, and he served with great distinction as an advisor and confidante to Rensselaer's presidents. Dr. Ray
Palmer Baker credited his staunch support for liberal studies at Rensselaer to the eventual establishment of the Rensselaer School of Humanities and Social Sciences.

George Horton served as President of the American Welding Society from 1939 to 1940 and as Chairman of the Chicago Plan Commission from 1940 to 1944. He was greatly pleased at his election to honorary membership in the Western Society of Engineers in 1944 and to the Chicago Engineers Club in 1943, considering these honors as recognition from his peers.

Harry J. Clarke graduated from Rensselaer in 1926 and joined Chicago Bridge and Iron the following year. He believed that an engineer and an officer of the company should know how to perform all of the jobs that he was called upon to supervise. Thus he served as a construction worker so as to understand what was involved in the company operations. As a result he became expert in field operations and construction techniques, and he was sent to many foreign countries to supervise company construction. He was appointed Vice President of Field Construction in 1952, becoming Senior Vice President for Operations in 1961 and President in 1962. He retired from the company in 1968. During his presidency, Chicago Bridge and Iron experienced unprecedented growth. He was a great believer in cooperation and teamwork and in the reduction of unnecessary expense. From his own experience he had a profound empathy for company field workers and an understanding of the problems which they confronted.

He was a member of the founders council of Nova University in Ft. Lauderdale, Florida and a member of various local
civic organizations in Greater Chicago. He died in 1975.

John T. Horton RPI'52 joined Chicago Bridge in 1955. He served as an engineer in design and field construction and then as Manager of Special Designs. From 1961 to 1966 he served as Vice President for Research, and from 1966 to 1968 as Executive Vice President. He became President of the Company in 1968, serving in that capacity until 1969. During his presidency the company developed offshore storage tanks and became the foremost company specializing in nuclear safety and assurance. Its expertise is utilized in nearly every industrialized country in the world.

John Horton became a trustee of Rensselaer in 1968, and he continues to play an important role in the activities of the Board of Trustees. He spends considerable time on the Rensselaer campus consulting with faculty members and students and serving as an unofficial liaison officer between the Board and Rensselaer's various constituencies.
Associates of George Terry Horton '93 C.E. used to say that he would build anything of steel plates—so long as it was different. One time at the Chicago plant of Chicago Bridge and Iron Company, of which he was president, he built what he called a Horton-dome to learn if a large flat dome of steel plates would support itself. He also wanted to demonstrate that walls could be used to support buildings and to determine if it was possible to build a structure from materials and with methods not included in the building code. George's father, Horace E. Horton, founded Chicago Bridge and Iron and built its first plant in Chicago in 1889. When Horace Horton died in 1912, George Horton became president. He had previously served as Chief Engineer.

George Horton had an inquiring mind and he was constantly on the search for lighter and stronger materials and improved methods of construction. He was instrumental in the development of electric welding for construction, and he served as President of the American Welding Society in 1939 to 1940. He also established a Welding Laboratory at Rensselaer. During World War I he was associated with the Submarine Boat Corporation where he helped to bring about a weight reduction in the materials used for submarine hulls and, at the same time, increase the strength of the hulls. In World War II, Chicago Bridge and Iron was given the job by the Navy of building floating drydocks and LSTs.

George Horton was also interested in aviation. He flew planes of his own and was an extensive user of commercial airlines during their early days of operation. George and his brother, Hiram, once built and flew a plane that they made from the spare
parts which they scrounged from an airplane manufacturer. He also donated a plane of unique design to Rensselaer for use in laboratory exercises.

George Horton was a Trustee of Rensselaer from 1925 to the time of his death in 1945. As a trustee he worked to broaden the basis of a Rensselaer education, insisting that students at Rensselaer be educated in literature, writing and the humanities, and in the fundamental sciences as well as in engineering. He in effect helped to nurture the early growth of Rensselaer into a modern technological university. He served as President of the Rensselaer Alumni Association from 1933 to 1934; and he established four undergraduate scholarships and one graduate fellowship at Rensselaer. At the 50th anniversary of George Horton's association with Chicago Bridge, his employees and associates said of him, "Your originality of thought and engineering skill have been a constant source of inspiration to us...Because of your kindly interest in our welfare and your sympathetic understanding of our problems, our tasks have been made easier and you have won and held our affection through all the years of our association with you."

In 1943 George Horton was elected an Honorary Member of the Chicago Engineers Club, and in 1944 he was made an Honorary Member of the Western Society of Engineers, an honor which he highly prized. "To receive this honor from those who know me and my work best is truly gratifying," he remarked.
Harry J. "Josh" Clarke '26 C.E. was President of Chicago Bridge and Iron from 1962 to 1968. He joined Chicago Bridge in 1927 as a member of a field construction crew. In 1928 he went to Venezuela to supervise construction of eight 10,000 barrel tanks. He then was employed in the home construction office until 1944, but the job required many trips to foreign construction sites. He visited nearly all of the oil producing nations of the world, overseeing the erection of oil storage tanks. "Josh" Clarke was a great believer in the importance of knowing how to do the things one may ask others to do. He learned how to erect storage tanks by working with the company's field forces. He attended a welding school to learn how to weld. And, when he could be spared from his office work, he served as foreman on several jobs to get the feel of the work he was supervising.

After serving as Manager of the Erection Department, he was elected a Vice President in 1952. In 1961 he was promoted to Senior Vice President of Operations and the following year became President. During his presidency he guided the company through a period of tremendous growth.

His philosophy of management was to have competent, hard-working people in all managerial positions and then, to a large degree, to leave them alone. He preferred personal on-site visits to voluminous correspondence and he sought to make on-site decisions that were mutually developed by top management and the persons directly in charge of the operations.

"Josh" Clarke was a Trustee of the Boilermakers National Health and Welfare Fund, a director of the First National Bank of
Oak Brook, Illinois, and a member of the Founders Council of Nova University, Fort Lauderdale, Florida.
John T. Horton '52 B.C.E. earned a Ph.B. degree from the University of Chicago before coming to Rensselaer. At Rensselaer he served as an instructor in Theoretical and Applied Mechanics in 1952 and 1953, receiving his master's degree in Mathematics in 1954. He became President of Chicago Bridge and Iron Company in 1968, resigning in 1972 to become a consultant.

John Horton joined Chicago Bridge in 1955, working as an engineer in design and field construction, supervising an erection project in Spain. He then became Manager of Special Designs, followed by an assignment as Manager of Research. He was elected a Director of the Company in 1959. From 1961 to 1966 he served as Vice President for Research. He was Executive Vice President from 1966 to 1967, becoming President in 1968.

In 1968 John Horton also became a Trustee of Rensselaer, and he continues to serve as a Trustee. He has served as Chairman of the Trustees Committee on Student Affairs and on numerous other Trustee Committees. He is a member of the Illinois Academy of Science, Sigma Xi and Tau Beta Pi. His intellectual curiosity is similar to that of George Terry Horton, and he is constantly on the look-out for challenging problems and situations. He has helped to expand Rensselaer's intellectual horizons and to monitor the quality of its academic performance. Rensselaer students look upon him as a friend and champion, and faculty members as a source of intellectual stimulation.
This sampling of the successful careers of Rensselaer graduates in industry will be continued in Chapters on alumni who formed their own companies, on alumni as heads of Public Utility Corporations and, in part, on alumni who are associated with Industries that depend strongly upon engineering accomplishments.

From the foregoing brief overview, we are reminded of how much of our daily lives, our standard of living and our expectations of even better things to come depend upon the vision, leadership and ingenuity of people who are graduates of Rensselaer and its sister institutions, many of which could tell a similar story about their own graduates. Engineering education and its accompanying allied types of education contribute importantly to the lives of people all over the world. From our daily morning orange juice (FMC) to our late night snack (Borden's) we are reminded of the leadership of people who have benefited from the discipline of a technological education.
Although Walter E. Irving graduated from Rensselaer in 1896, it was not until 1952 that the Open Steel Flooring Institute honored him as the father of the steel grating industry—an industry that now does more than $50 million a year in business. Steel grating is presently used for industrial flooring, bridge decking, for catwalks in power plants, oil refineries, and marine installations, for loading platforms, mezzanines, safety steps, freight and tank car running boards, airfield mats, the surfacing of detours and dirt roads, etc.

During World War II, Air Force Lt. General Henry H. Arnold wrote to Walter: "Reports from the fighting front state that portable steel landing mats made it possible for airfields to be in action when the critical hour came. The Army Air Forces is proud of your work. Keep that landing mat coming. It contributes directly to smashing blows which will destroy the Axis."

The first use of Irving Steel Mats was for subway ventilating chambers. Soon their use was extended to providing ventilation for basement floors adjacent to sidewalks. For almost each new use of his grating, Walter Irving had to overcome skepticism and reluctance to adopt anything new. He told me that when he was trying to convince the City of Hartford, Connecticut, to permit the use of the grating in sidewalks next to buildings that needed light and air for their basements, he had to mount a vigorous sales campaign. "I went to a model agency and told them that I wanted three girls with the best looking legs
in the modeling business. The Hartford officials had objected to the grating because they thought women's spike heels would get caught in the mesh and the city would get sued. I built a runway at the hotel ballroom where we put on a demonstration. The runway was at eye level so the City Fathers could get a real good look at the beautiful legs. I don't think they ever looked at the grating to check whether any heels got caught. (They didn't get caught!) And I came away with my first big order for sidewalk grating. I had to repeat this show at several other cities. And it was always a success!"

Walter's associates said that he was happiest when he was selling a new idea and overcoming tough opposition. Although Walter was an inventor and innovator, he advised young men to keep asking a lot of questions and to seek advice, because "it is foolish to spend time and money to learn from experience when you can learn the same thing by asking questions." He warned, however, that one should draw his own conclusions from the information so garnered remembering that most people hate to go against tradition and try something new. And it took constant selling on Walter's part before grating was accepted as an element in construction.

The need to sell his ideas took Walter to many places in North and South America. On these trips he used to carry an RPI Alumni Directory with him. When time permitted, he organized informal luncheon or dinner gatherings of RPI alumni and thus laid the foundation for the organization of numerous local Alumni Chapters. He became honorary president of alumni groups in Mexico,
Puerto Rico, Cuba and Haiti. He probably knew personally more alumni of Rensselaer than anyone during or before his time. Rensselaer conferred upon him the honorary degree of Doctor of Engineering in June 1952.

Toward the end of his life when he was critically ill, he had his son Jim fix up a light truck to contain a bed, toilet and nursing facilities. Thus he was able to rest and follow his doctor's orders, and he was also able to make one final pilgrimage to his alma mater for personal visits with his friends there. When he came to my office he did not look like a seriously ill person. "Don't let appearances deceive you," he told me, "between chats and visits I have the nurse give me a shot of joy juice to keep me going. Don't tell me it's habit forming, because I'm soon not going to have any habits.." Characteristically, he was a determined innovator and accomplisher of what he wanted to do right up to his final days. He died in Darien, Connecticut, on May 5, 1958. He was born in Troy, New York, on August 17, 1874.
The following alumni bear names that have become familiar in many households throughout the world--they are Cluett and DuMont. Although Allen DuMont '24 founded his own company, Sanford Cluett '98 not only carried on a family tradition, but notably added to that tradition.

It has been said that Sanford Cluett '98 was to the textile industry what Steinmetz was to the electrical industry. He, for instance, held more than 200 patents in the textile field--the most famous two of which were for the Sanforized process and for Clupak, stretchable paper. During Sanford's lifetime more than 30 billion yards of cloth were processed by the Sanforized method, and it is estimated that over 2½ billion yards of cloth are Sanforized each year throughout the world. But Sanford's curiosity and versatility went far beyond textiles. He invented an improved method for solving higher mathematical equations; he became such an accomplished dancer and acrobat that he was invited to join a Russian Ballet troupe; he made improvements in the navigational instruments of ocean liners; he was an ardent sailor, hunter and fisherman; he was also an artist of considerable ability, and the doodles which he drew during the long meetings of Rensselaer's Board of Trustees, often made telling wordless comments about what he thought of the discussions. He was so expert at walking on his hands that once in a while when a social dinner became too stiff and formal, he would abruptly rise from his place at the table, throw his body up into a soft curl and then proceed to walk the full length of the table on his hands "without so much as jarring a champagne
When the Spanish-American War broke out, he left Rensselaer in May 1898 and enlisted as a private. Upon the recommendation of his colonel, he sought a commission in the First U.S. Volunteer Engineers and went before an examining board. Then the first question put to him was whether he knew anything about ballistics. "Yes," he replied, "I know a great deal about exterior ballistics. I have invented a chronograph for measuring the velocity of projectiles. It's much better than the one the Army is using now. The one the Army is using isn't good for more than 150 to 200 feet; whereas mine will measure velocities from 100 yards to a mile of flight with an accuracy of one-fifty thousandth of a second."

Among the many honors he received were the Longstreth Medal of the Franklin Institute and the Holley Medal of the American Society of Mechanical Engineers. He was a vice president in charge of research and engineering at Cluett, Peabody and Co., Inc. and a vice president of the Board of Trustees of Rensselaer. The royalties from his inventions of the Sanforized process are credited with having provided Cluett Peabody with enough income to permit it to weather the depths of the depression in the 1930's. But with all his inventive genius, Mr. Cluett said that he was not able to devise a bird feeder that a clever squirrel could not eventually defeat. "And they don't make a lot of false tries. They think about it for a while and then they go to work."

Sanford Cluett was born in Troy, New York on June 6, 1874. He died in Troy on May 17, 1968.
In 1912 when Allen B. DuMont '24 was eleven years old, he built his first radio set. During summer vacations when he was in high school and college, he served as a commercial radio operator on ships at sea. His summer radio job was the reason why it took him five years to graduate from RPI. One summer he took a job on a ship heading for Copenhagen, expecting to return in time for the start of the fall semester at Rensselaer. But his ship went more places than was originally planned, and he did not get back to the States until Christmas time.

Allen DuMont is best known for the company which bears his name; for the Dumont television sets, and for the DuMont television network. The DuMont enterprises were eventually merged with Fairchild Camera and Instrument Corporation.

But Allen DuMont would not have founded his own company had he not returned from a short vacation in 1931 to find himself out of a job despite the fact that he had already established an outstanding record of accomplishment. Following his graduation from RPI in 1923, he went to work for the Westinghouse Lamp Company as an engineer in charge of the development laboratory. Here he invented machines and methods for high speed radio tube production. So successful was he in devising methods to increase production and, at the same time, improve the reliability of the radio tubes that he won the Westinghouse award in 1927 for its most outstanding employee accomplishment. In 1928 he joined the De Forest radio company as chief engineer, a short time thereafter becoming vice president in charge of engineering, development and production. Under his direction the company was able
to raise its production of radio tubes to 30,000 a day. Once the radio tube production was going smoothly, Allen DuMont turned his attention to De Forest television development.

In 1931 the depression took its toll of companies that were pioneering new technological products and De Forest went out of business.

For some time Allen DuMont had been convinced that the cathode ray tube had potential in television, test instruments, radio compass, industrial, naval and other applications and he began to build and improve cathode ray tubes in his basement. From this modest start, the DuMont Laboratories grew. In the course of these developments, Allen was granted over 75 patents.

In 1944 Rensselaer awarded Allen DuMont the honorary degree of Doctor of Engineering for pioneering in the development and use of the cathode ray tube, the heart of radar and for his improvement of the art and science of television. Subsequently, he received honorary degrees from five other colleges and universities. Other awards have been from the American TV Society, the TV Broadcasters Award, the Marconi Medal of Achievement and the Rank of Chevalier in the National Order of the French Legion of Honor. But to Allen, none of these honors was as meaningful as his being declared National Champion of the American Power Boat Association, Power Cruiser Division in 1953, 1954 and 1955.
Three years after Wallace Rudd '33 graduated from Rensselaer, he won the 1936 McGraw-Edison for a technical paper. The contest was sponsored by the Edison Electric Institute. At the time he was working as a development engineer for Consolidated Edison Company of New York, a position which he held for eight years. He then became Chief Engineer of Induction Heating Corporation, specializing in high frequency heating of metals. In 1950 he founded his own company, Thermatool Corporation, serving as Vice President for research and development.

He has written many papers since his winning essay in 1936. These have been mainly in the field of high frequency heating and welding. He holds over 100 patents relating to the metal industry. A typical patent of his deals with the high speed continuous welding of pipe and structural shapes. Another patent concerns the continuous welding of tube to sheet for solar panels.

He attributes at least a portion of his success to his Rensselaer education which forced him to recite every day in every subject for four years. "It did something for," he said, "not being able to put off anything that was to be done unless you were willing to suffer the consequences. It caused all of us to have a certain sense of self-discipline."

In June 1963 the Rensselaer Alumni Association awarded Wally Rudd the Demers Medal for outstanding service to Rensselaer. Wally's company is now part of AMF Industries, and he is doing consulting on problems that interest him.

During his freshman and sophomore years at RPI, Wally was an ex officio hostler on the steam locomotives of the New York
Central in the Troy yards at the foot of the Approach. He did the yard handling, cleaning, etc., on the Laurentian Engine. This created a love for steam locomotives that is evident today by his hobby of building coal-burning locomotives that are operated on his 7½-inch gage railway in New Canaan, Connecticut.
When John J. Redfern, Jr. graduated from RPI in 1933, he went to work for Hoy & Company, Inc. in Albany, New York. He remained with Hoy as an engineer until December 1936. While working for Hoy, he looked about him and discovered that there were a great many people concentrated in the Albany-Troy-Schenectady area, who seemed to be as smart and as well educated as he was. (A later study showed that this area has one of the highest concentrations of Ph.D.'s in the United States.) John decided that it would be wise for him to go to an area where there were fewer well-qualified people per square mile.

Thus in 1937 he moved to Oklahoma City and struck out for himself as an independent oil and gas operator, at the same time doing graduate work in geology and petroleum engineering at the University of Oklahoma. In June 1939 he moved to Midland, Texas, where he has had his home and business ever since. In 1956 he became President of the Redfern Oil Company, also becoming President of the Redfern Development Corporation in 1961 and of the Flag Oil Corporation of Delaware in 1962. In 1970 the three companies of which he was President merged and became the Flag-Redfern Oil Company, which he headed.

A Trustee of Rensselaer since 1957, he is now Vice Chairman of the Board of Trustees, having previously served as Secretary of the Board for twelve years. John Redfern works hard at whatever he agrees to do, and so it is not surprising that he established somewhat of a record as a Trustee. He makes it a practice to get to Troy a day or so before a Trustees' meeting each year so that he can attend classes and visit with
faculty and students. Since Rensselaer is in the business of education, he thought it important that he observe the educational process at first hand. It was thus only natural that he was made Chairman of the Trustee Committee on Education (Academic Affairs Committee). This committee composed of Trustees, faculty members, and representative students recommends matters of educational policy and implementation to the Board.

In the fall of 1956, President Livingston Houston asked John Redfern to chair a three man committee of interested alumni to review the performance of the Annual Fund. This three man committee visited a number of institutions across the country and their report drastically changed and greatly improved Rensselaer's Annual Fund performance. In fact, the improved results earned Rensselaer The American Alumni Association first prize for alumni fund raising improvement. As a result of this report, Redfern was elected a Trustee of Rensselaer in 1957.

In May 1977 the Rensselaer Alumni Association presented John Redfern with its Distinguished Service Award for "leadership in the development of our nation's energy resources and for his energetic devotion to the betterment of Rensselaer and the welfare of its students." He was only the ninth person ever to receive this award.

In addition to John Redfern's presidency of the Flag-Redfern Oil Company, he is also Chairman of the Board of the Midland Map Company.

On March 6, 1975 John Redfern testified before the House Ways and Means Committee in regard to the tax bill then
under discussion and as to how it would adversely affect the search for more U. S. oil. He represented five Texas Oil and Gas Associations. He concluded with "My plea is: Consider the need to increase supplies here in the United States and measure your tax policy on whether it will increase the United States production."
Hugh Archer '37 E.E. remembers that when he was a freshman at RPI, Director Ricketts told him and other students that if they could graduate from RPI they would be able to take the resources of Mother Nature and turn them into things that were needed by society. "That's what engineering is," says Hugh, "and that's what manufacturing is, too."

Today Hugh is president and founder of the Spiratex Company, a manufacturer of extruded plastic products. He also owns Archer-Reed Company, an engineering consulting firm that has established a reputation for something that the U.S. Navy, Lloyd's of London, and other insurance companies call phenomenology. What this means is that he has established a reputation for being able to ferret out the causes of disasters and catastrophes such as fires, explosions, malfunctioning computers, machines that mysteriously turn themselves off or on, turbines that run amok, etc.

Upon graduation from Rensselaer, Archer went to work for Detroit Edison Company as a research engineer with responsibilities for physical measurements of basic phenomena, instrument design and construction, and industrial process troubleshooting. He then became Director of Research for Diffin Research Laboratories, Inc. In this position he dealt mostly with radiation studies and measurements. With such a background, he was asked to become the Assistant to the Director of the Bikini Bomb tests with responsibilities for observing and interpreting basic physical phenomena associated with the explosion of the atomic bomb. In this connection he helped to develop the instrumentation
that measured the phenomena in sequence during the actual bomb explosions.

Although most of the Spiratex products are for specialized industrial uses, some have been for recreational purposes in the form of such items as hula hoops and large slides for amusement concessions. During the Hula Hoop craze, Hugh Archer kept a daily watch on the sales chart and, he reports, that the very first time sales turned downward, he ordered a stop to all hoop production, figuring that a fad lasts only a short time. He was correct and his was the only company that cleaned out its inventory just as the demand ceased. Though an RPI trained E.E., the Management of Manufacturing had captured his interest.

At RPI, Hugh was a member of Sigma Xi and Tau Beta Pi. A Rotarian since 1951, he served as President of the Dearborn Rotary Club, as Governor of Rotary District 640, and as an International Director of Rotary International from 1975 to 1977.

Hugh Archer's philosophy for work is "the extent to which a person wants to and does serve the needs of people determines the extent to which he will be successful; furthermore, consideration for the dignity of employees and co-workers is essential....Spend your efforts on matters that will benefit society, and show your associates and workers just how their jobs contribute to that benefit."
When Royden C. Sanders, Jr. '38 was in his junior year at Rensselaer, he invented a radio altimeter which was later used by thousands of American aircraft during World War II. From 1938 to 1951 he was employed first by the Radio Corporation of America and then by the Raytheon Company. In 1951 he founded his own company, Sanders Associates, Incorporated. This firm, which has been a major supplier for the U. S. Department of Defense and for NASA of radar systems, guided missiles and automatic controls has now diversified into such various fields as subminiature packaging techniques and peripheral equipment for computers. It has facilities in New Hampshire, Massachusetts and Maine and it employs over 2,000 people. At one time, its backlog of orders amounted to more than $100 million.

Mr. Sanders has served on numerous advisory boards for the Federal government and for the State of New Hampshire. In 1969, at the request of Governor Walter Peterson, he served as chairman of the New Hampshire Citizens Task force to study the effectiveness of the New Hampshire government.

In 1962 the University of New Hampshire awarded him the honorary degree of Doctor of Laws, and in 1971 Rensselaer gave him the honorary degree of Civil Engineer. He is a Fellow of the Institute of Radio Engineers and the recipient of the Navy Distinguished Service Award.
Keeve M. Siegel '44 was a trustee of Rensselaer from 1969 to 1974. He received both his Bachelor's and Master's degrees in physics from Rensselaer. He earned his Doctorate in Physics at the University of Michigan where he later served as a professor of electrical engineering and head of the radiation laboratory there. He was a fellow of the Institute of Electrical and Electronic Engineers and he held numerous leadership positions in the International Scientific Radio Union.

He was a member of the Scientific Advisory Board of the U. S. Air Force and he served as a consultant for NASA, the Department of Defense and other Federal Agencies.

In 1960 he founded Conductron Corporation which became involved with laser photography and other specialized research. After selling Conductron to McDonnell Douglas Corporation in 1966, Keeve founded KMS Industries and Gelman Instrument Company, serving as president and chief executive of both. KMS is a conglomerate. One of its constituent companies is the producer of Unicolor products for the home processing of color photographs. (Keeve asked me to try one of his experimental color processing kits, figuring that if I could get results with it, almost anyone could.) Since 1970 KMS has been devoting major attention to fusion research. At the time of Keeve Siegel's death on March 14, 1975, he was in Washington testifying before a Congressional Joint Committee on the feasibility of using fusion as a major source of power for electrical energy.
When Harry Apkarian '46 B.M.E. graduated from high school, he expected that the job he had as a machinist in a local Watervliet, New York, steel plant to be a permanent one. As he became more fascinated with machinery, the plant manager encouraged him to get an engineering education at nearby RPI.

Harry took the advice and went to see Elmer Siple, then Director of Admissions. Elmer told Harry he lacked several math courses required for admission. He suggested that Harry engage a local high school teacher to tutor him in the necessary mathematics courses and, if he was successful on an examination, Siple would arrange for his admission to RPI.

After successfully completing the required and the entrance examination courses, Harry began his mechanical engineering studies in September, 1942. During his freshman year, he continued to work nights at the local steel plant to finance his education. In his sophomore year, he joined the U. S. Navy V-12 Program until graduation in early 1945.

Recently Harry stated "whatever progress I have made in my career is largely attributable to help I received from many people over the years. If I were to identify a particular individual most helpful to me in those early years, it would be Mr. Siple."

Following graduation from RPI and a year and a half hitch with the Navy, Harry joined the General Electric Company. He organized General Electric's Bearing and Lubricants Center and pioneered on several advanced lubrication programs for nuclear, aircraft engine and space applications. Later, he was promoted to Manager of Applied Mechanics in General Electric's General Engineering Laboratory.
In 1961, Harry Apkarian and Dr. Beno Sternlicht resigned from General Electric to form their own company--Mechanical Technology Inc. (MTI). Sternlicht was appointed Board Chairman, and Harry became President and Chief Executive Officer. Today the company has sales of about $50 million and employs 850 people.

"The American system," Harry says, "...has been very generous to me. And I believe that if you take from the system, such as education, then you ought to support it and strengthen it."

Just how much Harry is supporting and strengthening the system can be seen from Harry's volunteer activities. He is Chairman of the Board of Trustees of Russell Sage College, Vice Chairman of the Board of Albany Medical College, Adjunct Trustee of RPI, a Director of Sunnyview Hospital in Schenectady and a Trustee of St. Gregory's School for Boys in Loudonville, New York. In 1977, he was awarded the Albert Fox Demers Medal for outstanding services to the RPI Alumni Association and in 1978 he received the VIP award from the Society of Manufacturing Engineers. He was recently appointed by Governor Carey of New York to the Ad Hoc Panel on Executive, Legislative and Judicial Compensation, and he serves on the Advisory Council on High Technology Opportunities in New York State. Not bad for a fellow who was going to spend his life as a worker in a steel mill!
There has already been enough drama in Joe Gerber's life to provide material for several novels. And the radio program "The Cavalcade of America," the magazine Nation's Business and the Rensselaer Alumni News of September 1950 have already featured parts of that life. Born in Vienna in 1924, Heinz Joseph Gerber, RPI '47 and his family had their upper middle class family life completely shattered by the Nazi take-over of Austria in 1939 and 1940. Attempting to escape into Switzerland, Joe and his family were seized and put into a concentration camp. After an escape, they were again seized and held until influential friends of the family managed to obtain a release for Joe because of his youth. His mother was also released, but they never heard from Joe's father again.

When Joe and his mother arrived in the United States, they had practically no money and they both took on a variety of menial, low-paying jobs. Friends helped them get to Hartford, Connecticut, where his mother found work as a dressmaker in a store and Joe picked tobacco in the Connecticut Valley. Soon he found better paying jobs and entered high school as a Junior. While in high school, he showed talent in science and mathematics and he struggled hard to perfect his knowledge of English. Winning a high school scholarship for college, he chose RPI. It was at RPI that he made his first invention--a proportional slide rule made from a pajama band--to enable him to catch up with some work he had let slide because of "extra-curricular" activities. When he showed his "invention" to his professors, they urged him to perfect it, one professor even hailing it as "the greatest engineering tool since the slide rule." In the
process of perfecting it, Joe found that a triangular spring, appropriately anchored and buffered, produced the desired accuracy.

The proportional slide rule was the beginning of the Gerber Scientific Instrument Company, now a division of Gerber Scientific, Incorporated. Other Divisions are Gerber Garment Technology and Gerber Systems Technology. Ten years ago automation was practically unheard of in the garment industry. Today over 100 companies throughout the world have bought GERBERcutter systems used to cut fabric for apparel, footwear, upholstery, automotive upholstery and special composite materials for aircraft.

Gerber Systems Technology manufactures Interactive Graphic Systems whereby a designer, sitting at a video display station, literally draws with the help of a computer, modeling complex three-dimensional parts at speeds and accuracies no human can match. The system, furthermore, can automatically generate hard copy drawings and other documentation and, most importantly, it can generate a numerical control tape that directly drives a metalcutting or forming machine. It dramatically foreshortens the time between concept and finished product.

Gerber customers, in addition to such well-known U. S. corporations as General Motors, General Electric, Texas Instruments, Hewlett-Packard, Boeing, IBM, Lockheed, Arrow, Hathaway, Munsing-ware, also include such foreign companies as Volkswagen, Saab, Toyota, Datsun, Phillips, Siemens, Peugeot and others.

The United States is richer because of Joe Gerber, and Joe Gerber is a successful businessman because of the opportunity which he found in the United States.
On May 8, 1980, Joe was named the inventor of the year by Connecticut Patent Lawyers Association.
When Robert Fopeano '51 was a student at Rensselaer, he decided that his career should be in sales and marketing and, that while he was still young and single, he would like to find a job that entailed traveling. His first job with Link Aviation seemed to meet his objectives. It involved the installation of all-electronic jet aircraft flight simulators. These simulators were implemented with analog computers and this led to Robert's interest in the then developing field of digital computers. He decided that computers were a young industry and that he, therefore, would have a chance to grow up in it with less competition from older and more experienced people. He points out that no one in 1955 could have foreseen the explosive growth of the whole computer industry.

Fopeano's reading told him that there was beginning to be considerable activity in digital computers in the Los Angeles area although the large manufacturers of computers were then in the East. He thus sought and found a job in California with the Bendix Computer Division as a field service engineer. He then was transferred to the East where he eventually became Eastern regional manager. His personal compass, however, continued to point toward the West. Thus in the spring of 1961, when the Western manager for Bendix resigned, he was able to convince management that it would be a good move for them on the basis of the candidates available, to give him the job as Western regional manager. He was the only one in the company who had someone ready to move up and take his position. He tells us that the value of having someone who has been trained for your job, has never since been lost on him.
He had thus put himself into the right position geographically and had obtained the right kind of experience for his next major step but, according to him, what happened at that point had a great element of luck. Early in 1962 he was approached by a man whom he had met earlier in his Bendix career. This man had left Bendix for a successful career at Packard Bell Corporation, and now he and some other people were leaving Packard Bell to start their own computer company and were assembling the management team. They called their company Scientific Data Systems, and they asked Bob Fopeano to join them as head of marketing. The new job meant a 40% reduction in salary, but it did offer a chance to own a portion of the stock of the new company.

Scientific Data Systems turned out to be one of the great success stories of the 1960s. Sales grew from $1 million in the first year to $7 million in the second, to $24 million in the third and then to $110 million in 1969. At that time, the company was sold to Xerox Corporation for "almost $1 billion in stock."

Commenting upon "success", Robert Fopeano writes "...the first objective in any career is to get the best possible education available. One must set reasonable personal objectives and see them through, maintaining the flexibility to make adjustments in the plan. One must position one's self to take advantage of potential opportunities...assuming one is blessed with reasonable intelligence, risk taking is most fundamental...without it there seems to be little chance of success."

Summing up Fopeano says, "One can only hope for an SDS situation once in a lifetime, but there is always that glimmer that
perhaps lightning will strike twice. If it doesn't, however, I can hardly complain."
In reply to a friend who had written to congratulate him upon his being elected to the presidency of the Connecticut Power Company, Allan D. Colvin '06 said, "Thank you very much for your kind note. I've grown accustomed to living in a fish bowl. What worries me is that they are now taking the water out of the bowl and I'm still in it."

When Allan Colvin graduated from Rensselaer in 1906, he was asked by Dr. William L. Robb, head of the Department of Electrical Engineering at RPI, to become Robb's assistant. Colvin later took a job as assistant superintendent of the electric department of the Troy Gas Company. He returned to Rensselaer for a brief time as a member of the electrical engineering faculty before joining the Hartford Electric Light Company in 1911 as assistant to the general manager. In 1921 he became general manager, serving in that job until 1929 when he joined the Connecticut Power Company as Executive Vice President. Later Allan became a director of both the Hartford Light Company and the Connecticut Power Company. He was elected President of Connecticut Power Company in March 1949. He died in May 1950.

Allan Colvin served as a trustee of Rensselaer from 1931 until his death. From the time of his election as a trustee, Allan and his father, Henry, president of the Manufacturer's National Bank of Troy, served together on Rensselaer's Board of Trustees until his father's death in 1936.

One of Allan Colvin's concerns as a public utility
official and as a trustee of Rensselaer, was the need for a
greater understanding and practice of human relations and of pub-
lic relations. "Engineers," he once remarked, "tend to leave out
an important factor in most of their equations, and that is the
human factor. In addition to providing the public with the best
possible service, the public utility engineer also has to eliminate
community misunderstanding, and he should work equally hard at
accomplishing both of these objectives."

Writing to President Houston one fall he said, "I am
very much indebted to you for the newspaper clipping containing
the photograph of the football trophy (which he had donated). I
am sorry I was not able to go to the game. My next door neighbor
evidently knew how it was going to turn out as he dropped dead
the night before. Besides it rained on Saturday."

As a trustee of RPI, Allan attempted whenever he could
to interest wealthy Rensselaer Alumni to contribute to the Insti-
tute. After one such attempt in which he called upon an alumnus
on the yacht which the alumnus owned, he reported, "They were
sleeping seventeen on board last night, of whom five constitutes
the crew...the oil painting in the room which would be the living
room onshore is of a former schooner which he owned and which
was ultimately lost in a storm. He told me it was painted by a
one-armed man. I don't know whether he paid the man for both arms
or not...It is certainly evident that there is more money building
things for a public utility than working for a Public Utility."

A hard, thorough worker, he devoted most of his profes-
sional life to the public utilities which he helped to manage.
His one hobby, a lifetime one, was Rensselaer Polytechnic Institute. Writing to congratulate President Houston upon Houston's award of an honorary degree from Stevens Institute of Technology, Allan stated, "I have never heard of Miss Honoris Causa, but I suppose she must be related to Connecticut's Miss Nolo Contendere."
Kenneth P. Applegate '12 was president of the Hartford Light Company from 1951 to 1956. He had joined the company immediately after his graduation from Rensselaer in June 1912, serving successively as power salesman, purchasing agent, general manager and vice president. He was elected executive vice president in 1946.

He was a Navy veteran of World War I, serving as an engineering officer with the Atlantic Fleet from 1917 to 1921. In World War II he was chairman of the Utilities Division of the Hartford War Council.

In addition to his professional work, he was also active in Hartford Community affairs, serving as President of the Hartford Rotary Club, as President of the Governmental Research Institute Inc. and as a Director of the Hartford Chamber of Commerce and the Hartford YMCA.

Like Allan Colvin, Ken Applegate's major hobby was Rensselaer Polytechnic Institute. He was elected an Alumni Trustee in 1937 and a life trustee in 1941. He was an officer of the Board of Trustees from 1943 to the time of his retirement from the Board in 1963, first as Secretary of the Board and then as Vice President of the Board. He also served on the Trustee Presidential Selection Committee that nominated President Houston, and he was Vice Chairman of the Rensselaer Development Council. He rarely ever missed a meeting of the Board or of its committees.

Ken Applegate was also instrumental in the founding of the Hartford Graduate Center, handling many of the delicate negotiations that allowed Rensselaer to operate a graduate school in
the State of Connecticut for the advanced education of working professionals. He actively and successfully solicited financial support for the center, helped the center to secure the services of distinguished adjunct professors, and encouraged his fellow businessmen and industrialists to support the continuing education of their promising young professionals.

Like many New Englanders, Ken was soft-spoken and laconic, and some of his best anecdotes were one-liners. Commenting upon the ability and foresight of one of his subordinates whom he was recommending for promotion he stated, "He's always well prepared--the kind of guy who carries extra toilet paper in his back pocket."
Major General Edmond H. Leavey '22, as deputy commander and chief-of-staff of the U. S. Army in the Western Pacific, acting for General Douglas MacArthur, accepted the surrender of the Japanese forces in the Philippines from General Tomoyuki Yamashita.

General Leavey was born in Longview, Texas on July 21, 1894. From 1911 to 1913, he was a student at Texas A. and M. University. He left Texas A. and M. to accept an appointment to the U. S. Military Academy from which he graduated in 1917. He then carried out a variety of military assignments in the Army Corps of Engineers until his appointment to Rensselaer, from which he graduated in 1922. During the 1930s, he served as deputy administrator for the U. S. Works Progress Administration in New York City and in 1940 he was appointed assistant commissioner and Chief Engineer of the National Works Progress Administration. He also served as Chief of Engineers for the U. S. Army.

General Leavey's special expertise lay in coordinating the efforts of those involved in moving, sheltering, training and warehousing of vast numbers of troops and supplies in the whole field of logistics.

During World War II General Leavey's assignments included service as Acting Chief of Staff, U. S. Army Northern Ireland Forces, Chief of Staff and then Commander of the U. S. Mediterranean Base, and as Deputy Commander and Chief of Staff, U. S. Army Forces, Western Pacific.

In 1956 General Leavey was elected President of Inter-
national Telephone and Telegraph Company. Shortly after General Leavey became President of I T & T, Colonel Sosthenes Behn, founder of the company, retired, leaving General Leavey in full command. He retired as Chief Executive of I T & T in 1959.

In 1957 General Leavey was elected a Trustee of Rensselaer. He received the honorary degree of Doctor of Laws from Texas A. and M. University and the honorary degree of Doctor of Engineering from Rensselaer in 1946. General Leavey's military decorations include the Distinguished Service Medal, The Legion of Merit with two Oak Leaf Clusters, and a Gold Star. He was appointed an officer of the French Legion of Honor and was decorated with the Croix de Guerre with Palm.

General Leavey married Miss Ruth Farrington, daughter of the late Governor W. R. Farrington of Hawaii. He has served as Chairman of the Hawaiian Advisory Committee on Science and Technology and as a regent of the College of Hawaii. He died in 1980.
Raymond A. Gibson '23, former Chairman of the Board of
Northeast Utilities and the Hartford Electric Light Company,
devoted most of his career to the development of both light and
enlightenment. In addition to his business and engineering
career, he served as Founder, Regent and Chairman of the Execu-
tive Committee of the University of Hartford and also as a trus-
tee of the Rensselaer-sponsored Hartford Graduate Center. He
has served as a trustee and as an honorary trustee of Rensselaer
since 1963 where he was on Alumni and Development Committees of
the Board.

He joined the Hartford Electric Light Company upon
graduation from Rensselaer in 1923, rising through the ranks to
the position of assistant vice president in 1943. He became a
vice president in 1950; executive vice president in 1954; Pres-
ident and then Chairman and Chief Executive Officer in 1965. In
1966 he also became Chairman of Northeast Utilities. In 1968 he
retired from both the Hartford Electric Light Company and from
Northeast Utilities.

In addition to his voluntary services to higher edu-
cation, he has been active in the development of Hartford and
in the improvement of its civic activities, holding various
offices in the Hartford Community Chest and in the Hartford
YMCA. He served as Chairman of the Hartford Urban Renewal Team,
Chairman of the Committee for Hartford, and Vice President of the
Greater Hartford Chamber of Commerce. He also has served as a
director of the Aetna Insurance Company, the Phoenix Mutual Life
Insurance Company, the Society for Savings and several other
companies.

Despite his many business, professional and voluntary activities, Ray Gibson always seemed able to devote his full attention to whatever he was presently engaged in, carefully considering the facts and options before expressing his opinion and judgment. He is reputed to have told an associate, "I try to do my best with the problem at hand so it won't come back to bother me. That leaves me free to go on to something else."
When George L. Capwell '25 was elected president of Empresa Electrica del Ecuador, Inc. in 1959, El Telegrafo, Guayaquil newspaper, commented, "George L. Capwell, distinguished American engineer, has just been nominated President of Empresa Electrical del Ecuador. This information...has brought us great pleasure not only because Mr. Capwell is an old and appreciated friend, but also because we consider his designation proper recognition for the highly beneficial work which he has been carrying out for Guayaquil. He has not limited himself to the mere fulfillment of his duties as administrator of a foreign company, but has taken into account Guayaquil's progress and has contributed with all his energy to the increase of industrial and commercial activities, the betterment of the living conditions of the Guayaquil people and has given special help to sports, which he is closely associated with."

Capwell was called "the most popular gringo in Ecuador's history" by none other than Galo Plaza, president of Ecuador. Plaza said "George Capwell was a model of what can be done when enthusiasm, comprehension, and sympathy exist for friends and neighbors. His efforts were worth a hundred times more than ten ambassadors in promoting solidarity between the United States and Ecuador...Only when you find men of good will accompanying the dollars and machines will you find people crying at the departure of such as gringo Capwell."

As president of the Emelec Club of Guayaquil, George Capwell led the effort to build a sports stadium for the city. It seats 35,000 and it was named "Capwell Stadium" in his honor.
Capwell also helped to establish the American School in Ecuador, now the Colegio Americano.

As a boy of six, he went to Panama with his family where his father worked for an electrical engineer in the construction of the Panama Canal. There he learned to speak Spanish, and there he acquired his love of sports, earning his letter at the Balboa High School in baseball, basketball, tennis and swimming. At RPI "Cappy" was on the baseball and swimming teams. Upon graduation from RPI in 1925, he became a student engineer with American and Foreign Power Company in Cuba. In 1926 he went to Ecuador as an electrical engineer. He was made general superintendent and chief engineer in 1927, and in 1937 he was made general manager of both the Guayaquil division and the Riobamba division of the company.

Both Ecuador's minister of foreign relations, Dr. Jose Vincente Trujillo, and Antonia Quevedo, Ecuador's head of the delegation to the United Nations, have stated that no other foreigner has ever been so highly regarded and loved by so many Ecuadoreans.
One of George Beinetti's classmates once said, "That guy could sell Bikini's to the Eskimos,—he has such a tremendous personality." It is small wonder, then, that George S. Beinetti '33, former Chairman and Chief Executive Officer of the Rochester Telephone Company was named "Salesman of the Year" by the Sales Executive Club of the Rochester Chamber of Commerce in 1973. A year earlier he had been named "Rochester Engineer of the Year" by the Board of Directors of the Rochester Engineering Society. It is indeed rare that a person receives both honors.

George began his career in the telephone business as a clerk with the New York Telephone Company before entering Rensselaer. After his graduation in 1933 he returned to the New York Telephone Company serving in engineering, construction, and management positions in Albany, Elmira, Olean and Buffalo, where he served as Division Plant Superintendent.

In 1959 he became Senior Vice President of Operations for the Rochester Telephone Company. Three years later he was named Executive Vice President and, in 1964, he was elected President.

His contributions to the Rochester Community have been many and include membership in 21 civic, philanthropic and educational groups. In 1970 he served as President of the U. S. Independent Telephone Association. Previously he had served as Vice President of the New York Telephone Association.

George's services to education include his membership on the Board of Trustees of Rochester Institute of Technology and
of Rensselaer Polytechnic Institute and his service as a Director of the Joint College Fund. Active in Rensselaer fund raising, he has served as Chairman of the Rochester Area 150th Anniversary Fund Program, as Chairman of the Upstate New York Science Center Fund, and Chairman of Rochester Corporate Giving to Rensselaer. His career has been illustrative of the many contributions to humanity that a graduate of an institution such as Rensselaer is so well prepared to make.
Wells P. Allen, Jr. '49, President and Chief Operating Officer of New York State Electric & Gas Corporation, was one of the post-war students at RPI. He served with the Army of the United States from 1942 to 1945. He then entered Rensselaer and graduated in 1949. He married a Troy girl after his freshman year. According to him, this was to have someone pay his way through college.

Upon graduation from Rensselaer, Wells began his career with New York State Electric & Gas Corporation. He held several positions with the company before becoming an officer in 1963, a member of the Board of Directors in 1974 and President in 1976.

His other business associations include directorships of Empire State Electric Energy Research Corporation, Associated Industries of New York State, Inc., and the Columbian Mutual Life Insurance Company.

In the field of education, he is a member of the Foundation of the State University of New York at Binghamton and he is a member of the Rensselaer Council. He is a director and past president of the Broome-Tioga Chapter of the Association for Retarded Children, Inc.

His hobbies are golf and bowling. He is a Registered Professional Engineer.
Carolyn Chin '69 is presently Manager of Strategic Planning for the American Telephone and Telegraph Company in New York City. Recently she served as Assistant to the Secretary of HEW under an appointment as White House Fellow.

After receiving her bachelor's degree in Management Engineering from RPI, she went to Harvard Business School where she earned her MBA degree. Then followed a first job at Macy's where she rapidly advanced through the merchandising ranks. In 1976 "Ma Bell" induced her to join A T & T to put new life into their marketing and promotional techniques. One of her first promotions there was a line of Mickey Mouse Telephones, something which shocked company traditionalists but which proved very successful. Then she promoted Bell equipment at shopping malls, selling decorator items over the counter. People both within the company and without were incredulous that "Ma Bell" would resort to sales promotions, but the sales promotion sold equipment at a faster rate than anyone could have foreseen, and Carolyn chalked up another success. Then came the appointment as a White House Fellow.

While at Rensselaer she was the first woman to be elected to Phalanx and White Key. She headed RPI's Independent Council for two years. She credits her experience and education at RPI as excellent training for her position with A T & T. She said, "...it gave me an understanding of the role of engineers and scientists--an incredible asset in my work at A T & T, confidence in my ability to deal with mathematics and it enabled me to work with men in a managerial position where there were men
working for me and, importantly, it provided me with tremendous discipline and analytical skills."
In 1977 Glamour magazine selected what it termed the ten Outstanding Working Women in the United States. Two of them were RPI graduates! One of them was Carolyn Chin '69, a graduate in Management Engineering, the other was Roberta A. Kankus '73, Bachelor of Science in Nuclear Engineering.

She is the first woman ever to hold a Senior Reactor Operator's license for a commercial nuclear power plant. These licenses exist for nuclear plants only. She is licensed to operate the Philadelphia Electric Company's two 2200MW Peach Bottom Atomic Power Station, one of the world's largest nuclear-fueled electric generating stations. She has been responsible for all phases of nuclear power plant licensing and reporting, including the development and implementation of special plant operations projects. Presently, she heads an interdepartmental task force with consultants for the development of a company-wide system of automated records and information management system.

Ms. Kankus is continuing her education at the University of Pennsylvania and is a December 1979 candidate for the degree of Master of Science in Engineering and is continuing further graduate work at Drexel University. In 1976 she received the YWCA Leadership Award for Outstanding Contribution to Business, and she is included in the 1977 edition of Outstanding Young Women in America.

When I asked her to what she attributed her success, she replied, "Willingness to take a risk, a sound education, and the desire to keep on learning." She wrote, "If one stops learning, one loses the skills and abilities to seize upon the
right opportunity and to produce the high caliber work required to be successful...To tackle a tough problem, whether or not you solve it, is looked upon more highly than the solving of an easy or routine problem...The 'right' opportunity may be dead if you can't follow through with quality work."

In her non-work hours, Ms. Kankus spends time counseling women students on careers in science and engineering as an active member of the Society of Women Engineers.
Eminent Engineers

Because the vast majority of Rensselaer alumni are engineers and because so many of these engineers have achieved distinction in a great variety of engineering projects, I can in this chapter attempt to present only a sampling of the achievements in which Rensselaer graduates have played leadership roles. Even this sampling has to be severely constrained because engineers have also achieved eminence in parallel fields of endeavor such as in engineering education, public service, the armed forces and in national associations, all of which are treated in succeeding chapters. But even with the foregoing considerations, there remains the need for criteria for those who should be dealt with here. I have received valuable assistance in selecting persons to be discussed from Rensselaer's Deans and Administrators and from the Alumni Committee of the Rensselaer Board of Trustees, but the final responsibility for the selection of the persons to be included here has been mine, so direct your brickbats and cat-calls to me and not to those who so generously assisted me. The major criterion used for the selection of the persons presented in this chapter has been membership in the National Academy of Engineering. Several of us at Rensselaer have assisted members of the National Academy of Engineering in obtaining information about candidates to be considered for selection by the Academy. Thus we are cognizant of the kinds of achievements which the Academy is looking for, and I have tried to use similar or equivalent standards in the selection of alumni whose major work was performed before the establishment of the National Academy of
Engineering. The first of these is Major General Thomas F. Farrell '12.

From 1930 to 1941 General Farrell was Chief Engineer for the New York State Department of Public Works. In 1943 he became Chief Engineer for the China-Burma-India Theater of World War II, a post in which he supervised the construction of the famous Ledo Road. In December 1944 he was appointed deputy to Major General Leslie Groves for the leadership of the Manhattan Project - the development and use of the atomic bomb. In 1945 General Farrell was introduced to physicist Robert Oppenheimer, who gave him a "quickie course in nuclear physics." Of Robert Oppenheimer, General Farrell said, "Leaving out the tremendously complex formulas, he taught me nuclear physics in 36 hours." Apparently the teaching was so successful that General Farrell was appointed adviser to Bernard M. Baruch when Baruch represented the United States on the United Nations Atomic Energy Commission.

General Farrell retired from the Army shortly after World War II ended to accept the Chairmanship of the New York State Housing Authority, but in 1951 the Army recalled him for service as Assistant General Manager for Manufacturing in the Atomic Energy Commission with the responsibility for the acquisition of fissionable material.

Prior to his death in 1967, General Farrell went through a procession of retirements from the Army, from Federal and State Governmental service, and from private industry, but he was continually being called back to serve in posts such as that of Consultant to the New York World's Fair. His honors included
decorations from the United States, Great Britain and France, and RPI awarded him the honorary degree of Doctor of Engineering. General Farrell stated in an address at Rensselaer in 1947, "Atomic warfare is not the only road to destruction. The weakening of the moral fibre of a people through fear and appeasement is just as destructive."
The 1915 RPI Transit said of Emil H. Praeger '15 "He has success in his makeup and we look to big things of him in the future." But his fellow classmates had no notion of just how big those things were to be.

One of the greatest and most daring military projects of all time was the building of a protected harbor for the invasion of Normandy. This was the brain-child of Winston Churchill, but it was brought to design reality and execution by Captain Emil Praeger of the U. S. Navy's Bureau of Yards and Docks. Over two hundred large concrete boxes were built in Great Britain, towed across the English Channel on D-Day plus-1 and sunk in position about 4500 feet off shore at high tide. Later it became known that similar but larger breakwater units of steel were constructed under his direction in California for the invasion of Japan. These were to be towed across the Pacific and used in a similar manner, but they were never needed.

The Normandy invasion harbor project is but one of a large number of gigantic projects with which Emil Praeger has been associated and for which he served as Chief Engineer or chief consultant. These projects include: the major Parkway Program of New York City such as the Belt Parkway, Henry Hudson Parkway, Bronx-Whitestone Parkway, Marine Parkway and Cross-Bay Parkway; the development of Jones Beach, the structural design of the Nebraska State Capitol, the renovation of the White House, and the foundation design of the Tappan Zee Bridge and the Verrazano Narrows Bridge, the repair of the broken dikes at Zeeland in the Netherlands, the structural design for Shea Stadium and
Chavez Ravine Stadium, and the world's largest radio telescope at Arecibo, Puerto Rico.

Emil Praeger served as Head of the Civil Engineering Department at RPI from 1939 until he was called to active duty in 1942 in the Navy as a Captain in the Bureau of Yards and Docks during World War II. Praeger said of his campus experience, "Teaching gave me a sense of satisfaction, and I have done nothing that gave me a greater sense of pride."

Returning to civilian service, his work as a partner of Praeger-Kavanagh-Waterbury became so demanding that he had to resign his position as head of RPI's Department of Civil Engineering in 1946. In 1954 Rensselaer gave him the honorary degree of Doctor of Engineering, and in 1969 he became the second recipient of Rensselaer's Distinguished Service Award. He also received honorary degrees from St. John's University and from Manhattan College. The New York City Section of the American Society of Engineers named him its first Metropolitan Engineer of the year. He, too, was a member of both Sigma Xi and Tau Beta Pi. He died October 16, 1973.
When Milton Brumer '23 M.E. was a pre-teen-age boy, his father gave him an erector set. That was the beginning of Milton's fascination for structures. Milton recalls that the various components of the set were held together by an arrangement of nuts and bolts. "And do you know," he once remarked, "it was not until the late 1940's that bridge construction caught up with that toy and began using field bolts instead of rivets!" Metallurgy by then had developed bolts and nuts that were strong enough to do the job.

Milton received a degree in Mechanical Engineering from Rensselaer in 1923 and an M.S. in Mining Engineering in 1924 from the University of Alabama. In 1970 Rensselaer awarded him the honorary degree of Doctor of Engineering. Milton credits the mental discipline that RPI helped him to develop as one of the prime factors of his success. "The training was broad but yet comprehensive enough for me to make an easy transition from mechanical to civil engineering. Because of this training, I believe that I could have adapted to any of the four or five branches of engineering then available," he told us.

Milton began his career as a designer with the New York City Board of Transportation on the Independent Subway project. Then with the Port Authority of New York, he served as a design engineer for large bridge, vehicular tunnels and harbor facilities. He then served until the late 1930's as the Engineer of Tunnel Design for the Pennsylvania Turnpike Commission. His work has included in addition, the design of bridges and tunnels, highways, special structures and hangars.
One cannot travel by auto very far in the eastern part of the United States without making use of some construction that Milton helped to design and build or for which he has full responsibility. Here are some of the works with which he has been associated: the New Jersey, Connecticut, and Ohio Turnpikes, the New York Thruway, the Long Island Expressway, the Ontario Parkway in Rochester, N. Y., the Access Highway to the Dulles Airport, the George Washington Bridge, the Bayonne Bridge, the Lincoln Tunnel, the Walt Whitman Suspension Bridge, the Throg's Neck Suspension Bridge, a study for the second deck of the Golden Gate Bridge at San Francisco and the Verranzo-Narrows Bridge, for which he was entirely in charge of the project.

Milton has also had the capacity to share his knowledge and experience with many professionals in many lands. He has lectured before many technical societies and universities in the United States as well as in Canada, England, Iran, Turkey, Israel, Germany, Malaya, Greece, Italy, Denmark, Spain, France, Hong Kong, Singapore, the Philippines and Japan.

As a result of these and other accomplishments, Milton has been honored by a variety of organizations. In 1969 he was elected to membership in the National Academy of Engineering, considered by many the highest honor that can come to a professional engineer. Four years earlier the Society of Civil Engineers, Metropolitan New York Section, gave him the Engineer of the Year award. In 1972 the Rensselaer Alumni Association bestowed upon him its Distinguished Service Award.

In reminiscing about his career, Milton Brumer has
stated, "I have been extremely fortunate to have been associated with a group of dedicated partners and staff. Any major undertaking today requires the devoted efforts of the client, construction contractors' representatives and literally thousands of other skilled workers...the technical accomplishments of monumental projects are never the work of an individual." Like so many other successful RPI graduates, he was a member of Sigma Xi.

Milton is a Charter Member of the Rensselaer Council, a Life Patroon of Rensselaer. He is also an Advisory Council Member of the School of Engineering and Architecture of the University of Miami.
Clay Patrick Bedford '25 C.E. has been associated with some of the nation's largest engineering and manufacturing undertakings. Upon graduating from RPI, he became associated with Henry Kaiser, of whom he wrote, "Henry Kaiser had no engineering education whatsoever, but he had a fantastic memory and a very clear and practical sense of values; he had the courage to assign responsibility to very young people if he had confidence in them. As a consequence, young Edgar Kaiser and myself were given tremendous responsibility at a very early age with a great deal of freedom of management."

Shortly after joining Kaiser, Clay was off to Cuba to take part in the building of a 240 kilometer highway and 500 bridges in Camaguey Province. Then he helped to build a pipeline in Arizona, New Mexico and Texas. He was transportation superintendent in the construction of the Boulder Dam, and general superintendent of the construction of the Bonneville and Grand Coulee dams.

Clay is especially proud of two records that were set on these jobs. He says, "Our early crews were very much of a family affair regardless of whether we were building dams, pipelines, highways or ships. These records are a part of the spirit of the West, of which I was a part for over fifty years." The first of these records was established on the natural gas 12 inch diameter pipeline from El Paso through Douglas, Arizona, to Cannanea, Old Mexico. In March 1931, one of the four crews laid 6.42 miles of pipe in one work-day from daylight to dark. In an attempt to better this record, another crew laid 25 miles of pipe
in five days. Though this did not break the single-day record it, of itself, was also a record.

During the latter part of the construction of the Coulee Dam, on the Columbia River a little over 20,600 cubic yards of concrete was poured in one twenty-four-hour day from four 4 cubic yard mixers in one mixing plant! This dam was the largest thing built by man since the pyramids. The Washington Monument, 550 feet high could be placed today upstream of the dam, and it would be under water!

As World War II neared, Clay was put in charge of four California shipyards which launched not a thousand ships, but 747 ships of the Liberty, Victory, LST and C-4 classes in five years. At one of these shipyards--the Richmond shipyard--a 10,000 ton ship was launched in 3 days, 15 hours, and a few minutes after its keel had been laid. This established a record that has never been broken. Clay says, "We developed a rhythm in manufacture with one shipyard competing with the others to see which could produce a ship in the fastest possible time...we created incentive by competition."

After World War II was over, Clay Bedford became vice president for manufacturing of Kaiser-Frazier automobiles. Then, during the Korean War, he moved to Washington first in the Office of Defense Mobilization and then as assistant to the Secretary of Defense. His final position with Kaiser was as President of Kaiser Aerospace and Electronics Corporation.

Busy as he was with industrial and governmental affairs, Clay always seemed to find the time to serve education and
especially to serve RPI. He was a member of RPI's Board of Trustees from 1952 to 1968; he has served as a Director of the Educational Facilities Laboratory, a Regent of St. Mary's College, California and a trustee of the American Graduate School of International Management.

In 1970 Mr. Bedford received the Distinguished Service Award from the Rensselaer Alumni Association and in 1971 the honorary degree of Doctor of Engineering from Rensselaer.

The Clay P. Bedford Auditorium in the Communications Center has been named in his honor. As a production genius, Clay Bedford was interested in how things got done and how much they cost. After raising questions about the cost of an RPI education, he suggested the establishment of Project Reward, a project which would offer professional assistance to faculty members in helping them develop methods and equipment for more effective teaching. The present office of Instructional Media is one of the results of this project, and so is the Communications Center. During the studies which attempted to encourage faculty members to make their teaching more effective and less expensive, it became evident that the optimum use of instructional aids required a new type of classroom building. With the help of the Department of Architecture and a grant from the Educational Facilities Laboratory, Rensselaer first constructed an Experimental Classroom to test its innovative designs. Based upon the experience gained from this Experimental Classroom, the Communications Building was designed. The Experimental Classroom also provided the basic concepts for the design of classroom
buildings in the State University of New York and on many other U. S. college campuses. Even Great Britain's "Open University" makes use of some of the concepts that were first tried in Project Reward.

Clay Bedford's advice to the coming generation is to look for the essentials in any given situation. "When you find these essentials," he said, "you will be able to find simple solutions to many complicated problems."
Bertram D. Tallamy '25 has been responsible for the planning and construction of some of the world's most extensive projects in his positions as Chairman of the New York State Thruway Authority and as Federal Highway Administrator. In 1957 he served as Chairman of the U. S. Delegation to the International Conference of Highway Officials of North and South America, and in 1959 he was Chairman of the U. S. Delegation to the World Highway Engineers Meeting in Rio de Janeiro, Brazil.

Upon graduation from Rensselaer in 1925, Bert worked for private construction organizations in Western New York until 1929 when he became a partner in the firm of Sheehan, Fretts and Tallamy. While still a member of the firm, he became Deputy Chief Engineer of the Niagara Frontier Planning Board in 1936, becoming Chief Engineer two years later. In 1945 he became Deputy Superintendent of Public Works for the State of New York. In this post, he coordinated New York State's multi-million-dollar Postwar Construction Program. He also directed a state-wide analysis of highway conditions and future needs.

In 1947 Bertram Tallamy became Chief Engineer of Public Works, and on October 1, 1948 Governor Dewey appointed him Superintendent of Public Works, a position he held until 1955. As superintendent, he enlarged the Department's Bureau of Research, supervised an unprecedented program for the construction of State buildings, the reconstruction of its highways, and the improvement of its cross-State canal system. During the coal shortages of 1949 to 1950, Bert Tallamy also served as State Fuel Administrator.
Also in 1950, he was appointed Chairman of the State Thruway Authority. It was upon his insistence that the designers of the Thruway attempted to create an expressway of varying interests so that driver monotony and hypnosis would be minimized. Even while the Thruway was being designed and built, Tallamy began an organization that would be responsible for maintaining and operating the system and for implementing long range maintenance programs.

In 1956 President Eisenhower appointed Bert Tallamy to the post of Federal Highway Administrator, a post which he held until the end of the Eisenhower Administration in 1961. As Federal Highway Administrator, Mr. Tallamy fostered the development and conduct of a variety of road testing procedures to establish new highway design specifications and to create a set of long range highway maintenance requirements.

Upon leaving government service, Bert Tallamy established the Bertram D. Tallamy Associates & Consulting Engineers in Washington, D. C. This firm established long-range maintenance programs for the New York State Thruway, the New Jersey Garden State Parkway (Northern Section) and for numerous expressways in the City of Chicago and the State of Illinois. It also performed design studies for a large portion of the Nebraska State highways. These studies included environmental, economic, and social impact results arising from the contemplated construction.

When he is able to take time from attending the many award ceremonies that are designed to honor him, he likes to go to his summer home on Big Bowman Lake in Rensselaer County to engage in
fly fishing and grouse hunting. He used to like to ice-fish, but he feels that the winters are somehow getting colder than they formerly were.

In addition to a host of honors from professional engineering societies, he was awarded an Honorary Doctor of Engineering Degree from Rensselaer. He was given a citation in Engineering by the University of Buffalo and was named the "Man of the Year" by both the American Public Works Association and by Kiwanis International. Jointly, the American Association of State Highway Officials and the American Road Builders Association bestowed upon him the George S. Bartlett Award.

Regarding requirements for a successful career, Bertram Tallamy writes, "With a sound education and practical engineering experience, one must have the confidence to tackle new things--even things that are brand new to the profession itself. He must be able to take defeat gracefully and learn from it; and he must be able and willing to defend his position in a positive manner without appearing belligerent."

Like so many persons discussed in this book, he is a member of Tau Beta Pi and Chi Epsilon honorary fraternities.
A former professor of Ralph B. Peck '34 C.E. says of him, "He was probably the brightest and most able student I ever taught. 'Taught' is not exactly the right word, because many times he was ahead of me, but he never flaunted his knowledge, always made polite suggestions, and he was always careful to see that I did not lose face with the class."

Ralph Peck's father was a college-trained structural bridge engineer and he had learned and assisted his father before attending Rensselaer. Ralph was born in Winnipeg where his father, O. K. Peck, was working for the Grand Trunk Pacific Railroad. Later his family moved to Denver, Colorado where he graduated from high school. Because his father had held a high opinion of Rensselaer and because his family got passes from the railroads, Ralph came to Rensselaer where he earned his bachelor's degree in civil engineering in 1934 and his doctorate in 1937. Upon receiving his doctorate, he went to work for the American Bridge Company but, in the depression year of 1937, bridge building was a slack industry. Accordingly, Ralph applied for and received a scholarship for advanced study at Harvard. Here he studied under and became an associate of Arthur Casagrande and Karl Terzaghi, the recognized founder and leader in soil mechanics. Casagrande had been a student of Terzaghi. In 1939 Terzaghi became a consultant for the construction of the Chicago subway. In this work, he chose Ralph Peck as his assistant. He shortly joined Terzaghi and Casagrande as the undisputed leaders in the development and practice of soil mechanics and foundation engineering. In 1948 Terzaghi and Peck published "Soil Mechanics in Engineering Practice," a work that has been called
Ralph Peck was awarded the National Medal of Science for 1974 by President Ford. In 1975 he was selected as one of the top ten U. S. construction men of the past 50 years by the Construction Division of the American Society of Civil Engineers. Also, in that year, he was made a fellow of the American Academy of Arts and Sciences. He is a member of the National Academy of Engineering, Sigma Xi, Tau Beta Pi, and other honorary engineering and science societies. In 1974 Rensselaer awarded him the honorary degree of Doctor of Engineering for his development of the science and art of subsurface engineering, combining the contributions of the science of geology and soil mechanics with the practical art of foundation design.

For the major part of his professional life, Ralph Peck was a member of the faculty of the School of Engineering, University of Illinois. During his tenure at Illinois, he also served as a consultant for major foundation projects throughout the world. Some of these projects included the world's largest dams, the Trans-Alaska pipeline, the reconstruction of Anchorage, Alaska after the 1964 earthquake, tunnels for rapid transit systems in Chicago, San Francisco and Washington, studies for the Lamco Railroad of Liberia, foundation studies for the Latino Americana Building in Mexico City, Dead Sea Dikes, Israel, Aslantas Dam, Turkey, Krematsta Dam, Greece and for various defense projects for the Rand corporation, Space Technology Laboratories and the Aerospace Corporation.

Ralph Peck is the author or co-author of three books and of over 130 technical publications dealing with foundations, earth
pressures, tunnels, slopes, earth dams, etc.

Quite literally he is one of the Rensselaer graduates who has helped to change the face of the earth and to bring us more knowledge of the way soils behave.
During World War II, Dr. Paul Hemke, later Dean of the Faculty, said to me, "Dick, I've just had the daylights scared out of me. I've returned from Ft. Worth, Texas, where one of our recent graduates showed me a mock-up of a bomber for which he served as major aerodynamicist. Just four years ago, he was still here in college!" That bomber became the B-36, and that graduate was Robert H. Widmer of the Class of 1938.

While still a student at Rensselaer, Bob worked during the summers of 1935, 1936 and 1937 as an engine overhaul man for the Standard Aviation Company. After graduating from Rensselaer in 1938, he earned his master's degree at California Institute of Technology in 1939 and joined Convair in San Diego the same year. He has been with that company ever since.

From those early days Bob Widmer has continued to be one of our nation's most creative engineers in applying technology to the advancement of modern aircraft. His company, Convair, now General Dynamics, has given him much of the credit for the successful development of such major aircraft as: The B-36 10,000 mile inter-continental bomber; the B-58 supersonic bomber, the world's first aircraft capable of sustained long range supersonic flight; the F-111 variable wing sweep fighter-bomber; and the conceptual design of today's multi-national F-16 fighter, the first airplane incorporating fly-by-wire flight controls and primary structure using graphite composite material. For his work on the B-36, he received the Air Force Association's "Field of Science Award" in 1949, and in 1963 for his work on the B-58 he received the "Spirit of St. Louis Medal" from the American Society of Mechanical
In 1942 he was transferred from San Diego to Convair's Fort Worth Division as head of aerodynamics. At Fort Worth he assumed increasing engineering responsibilities progressing to Vice President of Research and Engineering in 1961. In 1971 he became the Vice President of Research and Engineering for both the Fort Worth and Convair San Diego Divisions of General Dynamics. In 1974 he was made Corporate Vice President of Science and Engineering for all of General Dynamics' engineering activities.

He has served on numerous committees of the National Advisory Committee on Aeronautics and as a consultant to the Department of Defense, the USAF Scientific Advisory Board and the USAF Aeronautical Systems Division. Bob has also been active in the area of engineering and scientific education. He is a member of the Board of Directors of the Southern Methodist University Foundation for Science and Engineering and a past member of Texas Christian University's Research Foundation, and the University of Texas Engineering Foundation.

Bob Widmer was elected to the National Academy of Engineering in 1977 and was the recipient of an Honorary Degree of Doctor of Science from Texas Christian University. Upon graduation from Rensselaer he was awarded the Ricketts Prize as the outstanding aeronautical engineer of his class. This is another example of the correlation between outstanding academic work and later professional excellence and eminence.
Seymour Bogdonoff '42 is typical of the new breed of engineer graduated from RPI during and following World War II. The extraordinary expansion of aerodynamics immediately after his graduation provided the opportunity for talented young engineers to develop with the field, which was well-funded for their researches. Presently Seymour Bogdonoff is the Chairman of the Department of Mechanical and Aerospace Engineering at Princeton University.

Upon graduation from RPI he went to work at NACA (predecessor to NASA) at Langley Field, Virginia where he specialized in Fluid and Gas Dynamics Analysis. In 1946 he terminated his association with NACA to return to graduate work at Princeton. There he developed facilities for a new high speed research laboratory which was the beginning of the present Gas Dynamics Laboratory for research associated with shock wave boundary layer interaction and base pressure problems. As an outgrowth of this work, he was responsible for the first hypersonic facilities above Mach 10 in the United States. Professor Bogdonoff's current activities include research in the areas of high speed fluid mechanics, gaseous lasers, and energy conversion techniques.

He was a research engineer at Princeton from 1946 to 1953 when he was appointed Associate Professor and Head of the Gas Dynamics Laboratory. In 1957 he was appointed Full Professor and awarded the Robert Porter Patterson Professorship of Aeronautical Engineering. He has held his present position as Chairman of Aeronautics and Mechanical Sciences since 1974.

He was a member of the Scientific Advisory Board of the U. S. Air Force for eighteen years. He presently is a member of
the Research and Advisory Council of NASA, a consultant to the National Science Foundation's Energy Board and its Science and Technology Advisory Board and a consultant to the office of Science and Technology Policy of the Executive Office of the President. He serves as a consultant to industry and to governmental organizations in aeronautics and power generation.

In 1977 Professor Bogdonoff was elected to the National Academy of Engineering. In 1968 he was the recipient of the Air Force Exceptional Civilian Service Award. He credits both his teachers and his students as important influences in his career. Their enthusiasm, intelligence, and questioning minds helped to provide the milieu both for his work and for his intellectual stimulation. He says, "I owe them a great deal."
The next time you're caught in a traffic jam, you might want to suggest that your city call for Alan M. Voorhees '47. Many cities have done so and they include Baltimore, Canberra, Australia, Caracas, Venezuela, Ottawa and Calgary, Canada, Tyneside-Wears, England, Lower Manhattan, N. Y., Minneapolis-St. Paul, Miami, Boston, Washington, Detroit and others.

After graduating from RPI, Alan Voorhees earned a Master's degree at MIT and later served as a Gordon Cass Fellow at the Yale University Bureau of Highway Traffic. As Traffic Planning Engineer for the Automotive Safety Foundation, he undertook the first application of the use of mathematical models for forecasting traffic. He also pioneered land use models and their application in a large number of American cities. His paper in 1955, "A General Theory of Traffic Movement" became the foundation for present day traffic forecasting techniques; furthermore, he served as special editor of the Journal of the American Institute of Planners on "Land Use and Traffic Models" which was published in 1959.

But in spite of all of his leadership and planning he says, "How little has been learned. We know so little about cities and about people's living habits that should be integrated into our designs." He also says, "We haven't learned how to talk to political leaders...We don't make the issues real. Our planning isn't worth much if communication breaks down."

Alan likes to plan on a large scale such as a comprehensive plan for highways for one-third of Puerto Rico, a statewide transportation study for Connecticut, and plans for a 110,000 resident Columbia, (see Michael Spear) the new town between
Baltimore and Washington. Much of his work is in conjunction with engineers and architects and, in spite of difference in outlook and philosophy and in spite of his blunt, outspoken habits, people seem to enjoy working with him. One engineer said, "He respects professionals not in his own area of expertise...Voorhees is sensitive to the ideas of others on a team."

In his forecasting of area growth and ensuing traffic patterns, he uses mathematical techniques that only a computer makes possible. "Actually," he says, "the computer creates the biggest need in our shop--good ideas." Out of this experience he recognized the necessity for Rensselaer to play a leading role in the use of computers in education and research. The result of this was his donation of the Alan M. Voorhees Computer Center, dedicated in October 1979.

He is a Past President of the American Institute of Planners and he has served as Chairman of the Executive Committee of the Transportation Research Board of the National Academy of Sciences. He was the first recipient of the Harland Bartholomew Award of the American Society of Civil Engineers and he has received the Transportation Research Board Award as well as the Past President Award of the Institute of Transportation Engineers.

From 1977 to 1979 he served as the first Dean of the College of Architecture, Art, and Urban Sciences at the University of Illinois, Chicago Circle campus. He is presently a Trustee of Rensselaer Polytechnic Institute.
Edward Woll '46, M.S.A.E. has been largely responsible for the conception and development of the F404 low bypass turbojet engine for the F-18 aircraft, a plane which is expected to maintain free-world air supremacy at a fraction of the cost hitherto thought possible.

This engine is but one of a long series of engines developed under Edward Woll's leadership that has established standards in the aircraft engine field. The J85 turbojet engine 25 years after its conception with its derivative and growth models, still powers thousands of aircraft including business jets, military trainers, and military fighters. He also played a key role in the development of the T58, T64 and T700 turboshaft and turboprop engines in the 1950's and through the 1970's. These engines are still in production and in extensive use in a large variety of helicopters and turboprop aircraft. In addition, he directed the development of the F101 engine for the B-1.

Edward Woll received a B.S. in M.E. from MIT in 1935. After receiving his Master's degree from Rensselaer, he joined General Electric Company in 1946 as a Development Engineer. Rising through the ranks, he became Manager, Product Planning, Aircraft Gas Turbine Department in 1952, General Manager, Small Aircraft Engine Department in 1961 and a Vice President of General Electric in 1968. In 1970 he was made Vice President and General Manager, Aircraft Engine Group Engineering Division. He is presently retired and serving as a consultant to the General Electric Company's Aircraft Engine Group.

In 1974 Edward Woll received the Dr. Alexander Klemin
Award for Notable Achievement in the Advancement of Rotary Wing Aeronautics. In 1977 he served as General Chairman of the SAE National Air Transportation Meeting. That same year he was the recipient of the Air Breathing Propulsion Award of the American Institute of Aeronautics and Astronautics, an Institute of which he is a Fellow. He is a member of the National Academy of Engineers and a Distinguished Member of the Jet Pioneers Association of America.

The Engineering Division which he led produces over 90 papers a year on advanced engine technology and, he, personally, has been the author of numerous papers for engineering and technical journals. He has also served as an advisor to numerous departments of the U. S. government and on AIA and JAE Industry Boards.
The next time you see a helicopter hovering overhead, chances are that Robert G. Loewy '47 had something to do with its development. He has published over twenty-four papers on the design and engineering of Vertical Takeoff and Landing aircraft and when he received the Lawrence Sperry Award of the American Institute of Aeronautics and Astronautics in 1958, for contributions by a young man to aeronautics, that award was based on a paper that changed from that time onward the way helicopter engineers thought about rotor aerodynamics.

After graduating from RPI, Bob Loewy earned his master's degree in Aeronautical Engineering at MIT and his Doctorate at the University of Pennsylvania. In his professional career he has been associated with the Glenn L. Martin Company; the Cornell Aeronautical Laboratories; the Vertol Division of the Boeing Company, where he rose to Chief Technical Engineer; the University of Rochester, where he was Professor, Dean of Engineering and Director of the Space Science Center; and RPI where he has been Vice President and Provost and Institute Professor.

He is a member of the National Academy of Engineering, a Director of Mohasco Industries and an advisor to the United Technologies Laser Advisory Group, and to the Vertol Division of the Boeing Company. In the past he has served as advisor to the Bell Aerosystems Company, the Xerox Corporation, the Institute for Defense Analysis, and as a member of the Board of Directors of General Technologies, Inc.

In U. S. Government service he was, in 1965 and 1966, Chief Scientist of the U. S. Air Force. He also served as Chairman
of the Air Force Scientific Advisory Board from 1972 to 1975, having been Vice Chairman from 1967 to 1975. He is presently Chairman of the Air Force Aeronautical Systems Division Advisory Group. He is also presently Chairman of NASA's Aeronautics Advisory Committee and Vice Chairman of the NASA Advisory Council having been Chairman of its earlier Research and Technical Advisory Council. He is a member of the Naval Studies Board of the National Research Council having served previously on its Aerospace Engineering Board.

Bob is an Honorary Fellow of the American Helicopter Society, of which he was technical director from 1963 to 1965, and a Fellow of the American Institute of Aeronautics and Astronautics. In 1966 and again in 1975 he was the recipient of the Exceptional Civilian Service Award of the U. S. Air Force. Like so many distinguished engineering graduates of RPI, he was elected to membership in both Sigma Xi and Tau Beta Pi.

His university affiliations include membership on the Visiting Committees of the MIT Department of Aeronautics and Astronautics currently and, formerly, the Air Force Institute of Technology.

"Civilian helicopter travel is growing rapidly all over the world," Bob Loewy says, explaining, "For distances up to 300 miles, it can be faster than fixed wing aircraft for the traveller because the 'copters can take off and land in populated areas, thus shortening significantly the groundside travel.'"

The careers of Alan Voorhees and Robert Loewy illustrate the intertwining of education, research, and civilian and governmental practice. There is not only an exchange of information
between these groups, but also an actual exchange of personnel with people such as Voorhees and Loewy holding important positions simultaneously in a number of these groups. As with most human affairs, but especially in the knowledge business, truly "no man is an island."
Sheldon Roberts '48 is one of those persons who defies categorization. He has helped to found two companies and he has been president of another company, so that he might just as logically have been discussed under the industry category or the company founders category; however, since he is now an independent engineering consultant, he is presented as an engineer.

Upon graduation from RPI, he earned his master's and doctor's degrees from MIT. Then he became employed by Dow Chemical Metallurgical Laboratories, and later he was associated with the Shockley Semiconductor Laboratory. In 1957 he became one of the founders of the Fairchild Semiconductor Corporation responsible for silicon crystal production and an advisor in transistor and microcircuit development. In 1961 he became part of a team that founded Amelco Semiconductor, a division of Teledyne, Inc. Following a period of independent consulting in materials and processes, he became president of Timelapse, Inc. a manufacturer of photographic and electronic systems.

He is the holder of a number of patents in the semiconductor field, the author of numerous articles in professional journals, and the author of a book, Magnesium and Its Alloys. He serves on the Board of Directors of several high technology companies, but one of his major interests is serving on RPI's Board of Trustees. He was Chairman of the Search Committee that selected George Low as Rensselaer's 14th President. He estimates that he spends between 10 to 20 percent of his time on RPI matters relating either to the Board of Trustees or to fund-raising.

"Perhaps I am a frustrated professor," he says, "but I
find the board exciting. It gives me a way to contribute and to have some impact. The important thing to me is to 'let the dogs bark, but keep the wagons moving.'"

Notably he was a member of both Tau Beta Pi and Sigma Xi.
Anthony J. DeMaria has had a career in acousto-optics and in picosecond pulse laser development similar to that of Robert Loewy in helicopter research. He has served as a consultant to top-level Governmental and industrial groups has published extensively and is the holder of twenty-five patents in the Quantum Electronics field.

He was born in Italy and came to the United States when he was four years old. He holds a bachelor's and a doctor's degree from the University of Connecticut and a Master's degree in Science, earned in 1960, from RPI. From 1967 to 1972, he served as an Adjunct Associate Professor at the RPI Hartford Graduate Center and as Adjunct Professor from 1972 to 1978.

In 1962, Dr. DeMaria was the first to report experimental results in controlling the output of lasers with acousto-optic devices. In 1966 he initiated the field of picosecond laser pulses, and he has published in excess of forty-two papers in the laser field. A former associate editor of the IEEE Journal of Quantum Electronics, he has served as editor of that Journal since 1977.

He was elected Vice President of the Optical Society of America in 1979 and will progress to President in 1981. Previous to the election to his present office in the Optical Society, he has been a member of the Society's Board of Directors, Chairman of its Technical Council, and Chairman of numerous society committees. He is also on the editorial advisory committee of Optical News and Physics Today, and served on the Board of Governors of the American Institute of Physics from 1979 to 1981. Furthermore, he
has served on several committees of the National Academy of Sciences and the National Academy of Engineering to which he was elected in 1976 for his pioneering work on the generation, amplification, measurement and scientific utilization of picosecond laser pulses.

He has presented numerous invited papers to leading academies and societies including the American Physical Society, the European Physical Society, the Institute of Electrical and Electronic Engineers, the National Academy of Science, the Academy of Sciences of the U.S.S.R., and numerous groups in the laser and optics fields, and at universities throughout the world. As a result of his laser research, he was elected a Fellow of the IEEE in 1978 and of the Optical Society of America in 1972.

He is Manager of Electromagnetics and Physics Labs of the United Technologies Research Center where research is being conducted in a great variety of highly specialized subjects and about which the educated layman has but an inkling of knowledge—subjects such as quantum physics, the generation and utilization of high-power laser radiation, microelectronics, microwave physics, digital sensors, plasmadynamics, electro-optics, and theoretical physics.

In 1978, he was awarded the Distinguished Alumnus Award of the University of Connecticut; the Morris N. Liebmann Award of the IEEE in 1980; and the first Davies Award of RPI in 1980. He served on the National Bureau of Standards Evaluation Panel of the Center of Electronics and Electrical Engineering from 1977 to the present, as a member of the Office of Undersecretary of Defense Research and Engineering Advisory Group on Electron Devices from
1977 and moved up to Chairman of the Laser Working Group in 1980. At his graduation from college, he was elected a member of Sigma Xi.

There are literally hundreds, possibly thousands, of other Rensselaer graduates who have had notable professional careers in some phase of engineering and who have made important and unique contributions to their profession. Some of these people will be discussed in the following chapters of this book but, because of space and time limitations, most of them will have to be omitted. As the perspicacious reader will have observed, the people selected for inclusion in this chapter have for the most part been members of the National Academy of Engineering. Those whose careers flowered before the establishment of the Academy have been selected based upon standards similar to those which the Academy now uses in considering candidates for election to its membership.
Scientists

Although Rensselaer awarded the first degree in Science ever granted in the United States (the Bachelor of Natural Science degree in 1835), its major emphasis has been on the education of engineers. At various times after its founding, it awarded Bachelor of Science degrees in Chemistry, but the first formal programs leading to Bachelor of Science degrees were not publicized until 1925, and it was not until 1953 that there was formal coordination of the science programs. In 1957 the School of Science was organized under the leadership of a Dean of Science, and since that time the study of science has burgeoned in both the undergraduate and graduate levels. Rensselaer awarded the first earned doctorate in Science in 1920, and from that time to 1960 it awarded on the average less than 10 science doctorates a year. By 1960 that number had increased to 29 and by 1966 to 76 doctorates.

Today only about five percent of engineering graduates take their doctorates in engineering; whereas, the number is 15% for science graduates. Since both emphasis upon graduate study and upon science is relatively recent at Rensselaer, it is remarkable that so many graduates have become distinguished scientists, including one Nobel Prize winner. About 54% of the Rensselaer alumni are engineers; whereas 7% are scientists.

W. Lincoln Hawkins, Rensselaer '32, is Chairman of the Board of Trustees of Montclair State College and a member of the Bell Telephone Research Laboratories. He is an authority on the use of plastics for the insulation of wire and cable, and he is
the editor of *Polymer Stabilization*, a subject upon which he has lectured extensively.

After graduating from Rensselaer with the degree of Chemical Engineer, he earned his Master of Science degree from Howard University in 1934 and his Ph.D. degree in Chemistry from McGill University in 1938. He served as a special lecturer at McGill from 1938 to 1941 and as a National Research Council Fellow at Columbia from 1941 to 1942. He joined Bell Telephone Laboratories, Inc. in 1942.

In 1970 he was awarded an Honor Scroll from the American Institute of Chemists. He has contributed to numerous professional journals and has written chapters for books. He is a member of the National Academy of Engineering and of Sigma Xi. He has served on the Montclair Town Planning Board and as Chairman of the Board of Trustees of Montclair State College. He holds patents in the field of polymer stabilization.
Drs. Milton M. and Zaka I. Slawsky '33 (physics) are both in the Department of Physics and Astronomy at the University of Maryland, College Park. Mitch is a Fellow of the AIAA and Zak is a Fellow of the A.P.S., both are Fellows of the Washington (D.C.) Academy of Sciences.

Friends will remember the Slawskys as a team of identical twins who were bright, personable, and not above their twinship to play tricks on unsuspecting people. After earning their Bachelor's degrees from Rensselaer, they both obtained Master degrees from Cal Tech in 1935 and then their Ph.D's from the University of Michigan in 1938, Mitch in experimental and Zak in theoretical Physics. They are probably the only American born twin Ph.D's in Physics.

Both joined the staff of the Naval Ordnance Laboratory shortly before World War II. While Mitch went to the National Bureau of Standards in 1948 and then to the Air Force Office of Scientific Research in 1956, to become the Director of Physical Sciences, Zak remained at N.O.L. to become Chief of Physics Research and Professor (PT) in charge of the University of Maryland off-campus graduate program in physics at N.O.L.

After retiring in 1974, they established a massive tutoring program in Physics for the Department of Physics at the University of Maryland. This tutoring is free to the students and to the University. It is officially known as the Slawsky Physics Clinic. Hopefully it will be duplicated in other large universities.

Both Milton and Zaka Slawsky are members of Sigma Xi and both have been elected Fellows of their respective professional
societies. Milton is a Fellow of the American Institute of Aeronautic and Astronautics, and Zaka a Fellow of the American Physical Society. The Washington Academy of Science recently awarded Milton and Zaka the Leo Schubert Award for their work in establishing and operating the Slawsky Physics Clinic at the University of Maryland.
S. David Pomrinse is President of the Greater New York Hospital Association, a post he has held since 1977. Prior to that he was Medical Director and Executive Vice President of the Mount Sinai Hospital in New York City. He described his job there as being exactly like running one of America's larger corporations. "We have 7,000 people working here, an attending staff of 1200, and a budget of $160 million a year...In size of operation, Mount Sinai would rank as one of the country's 600 largest corporations."

Dr. Pomrinse graduated from Rensselaer with a B.S. in Biology degree in 1937. He had entered RPI intending to become a physicist, but a course with Professor Archie Bray changed all that. "Professor Bray" he says, "was the finest teacher I ever had - at any level." Turned down by 17 of 18 medical schools ("There was a quota system in those days" he explained.), he entered and received his degree from Great Western Reserve University in 1941 with a specialty in internal medicine. Then followed two years as a junior medical officer with the U. S. Navy, first aboard an attack transport and then on a Naval Hospital Ship.

After nine years in private practice, he took a job with the U. S. Public Health Service as Chief, Health of the Aged Branch. It was here that he initiated studies that eventually lead to the U. S. Medicare program. He served with the Public Health Service from 1956 to 1961 at which time he joined the administration of Mount Sinai Hospital.

Dr. Pomrinse has been elected a Fellow of four professional organizations, American College of Hospital Physicians, American College of Physicians, U. S. Public Health Association, and the
New York Academy of Medicine. From 1965 to 1971, he served as a consultant to the National Institutes of Health on rehabilitation and health services, he has lectured at numerous colleges and medical schools, and he served as Secretary of the New York State Hospital Association in 1976. In 1975 he won the Edgar Hachow Award of the American College of Hospital Administrators.

David Pomrinse has written over 44 professional papers for publication or delivery to his colleagues as speeches. Some of them have interesting titles. For instance, "Marginal Man - A Concept of the Aging Process" and "What Incentives Could Motivate Hospitals Toward Change Instead of Game Playing?" and "Health Care Inflation in the United States: Toward a Unified Theory of Cause and Control." But with all his achievements and honors, Dr. Pomrinse still looks back to his undergraduate days at Rensselaer and says, "There's no telling where I would be now if I hadn't met Archie Bray and switched from physics to biology."
When Edwin C. Holmer '42 B.Ch.E. was a student at Rensselaer, he was President of the Rensselaer Union, President of his Junior and Senior Classes, a member of Phalanx, White Key, and the Interfraternity Council. He was also elected to Tau Beta Pi.

Ed Holmer's present position is that of President of Exxon Chemical Company and Vice President of the Exxon Corporation.

He joined the Exxon organization upon graduation and has been with Exxon for the past 38 years. His first job with the company was as a process engineer. Then followed a variety of assignments with Esso Research and Engineering Company. In 1956 he was appointed Assistant Director of the Chemical Research Division. He moved to Jersey Production Research Company in 1959, becoming President of that company in 1962. When that company was combined with Exxon's exploration and research division in 1964, Holmer was named president of the resulting company - Exxon Production Research.

In 1966 he was made senior vice president of Exxon Chemical Company, and in 1968 he was promoted to executive vice president. Then there followed in 1974 a tour of duty with Esso Middle East. In May 1976, Ed Holmer was named President of Exxon Chemical Company. In this post he is responsible for the worldwide operations of the chemical division of Exxon Corporation.

The vast variety of products created and developed by Exxon Chemical are helping to conserve scarce critical materials and, at the same time, enrich people's lives. They range all the way from large volume, commercial chemicals such as olefins, aromatics, plastics and fertilizers to specialty chemicals which are tailored to many specific end use applications.
When Ronald Estabrook '50 B.S. Biol, came to Rensselaer in 1950, he was already married. As one of the hundreds of returning war veterans he lived in Rensselaerwyck on about $85 a month, and he heated his apartment with a little kerosene stove in the middle of the living room. "It was the only heat we had," he explains. As a Navy veteran he had chased submarines in the Pacific and swept mines. "When I came back from war, I knew what I wanted," he said, "The engineering context in which I was educated proved to be a tremendous help to me—especially mathematics, chemistry and physics."

Today he is Chairman of the Department of Biochemistry at the University of Texas Health Science Center in Dallas. For three years he also served as Dean of the Graduate School of Biomedical Sciences. In 1977 he received an award from the Federation of American Societies of Experimental Biology for his research into cellular responses to carcinogenic agents.

Dr. Estabrook is a member of the National Board of Medical Examiners, the Association of Medical Colleges and the Coordinating Council of Medical Education. Despite his administrative duties and his Board memberships, he still teaches biochemistry at the Health Science Center and by television to at least seven other medical schools.

Dr. Estabrook recalls, "What I remember most about my RPI experience was that I felt an intense educational experience. And it was intense! We had excellent professors such as Professor Roland Walker and, as good professors should, they pushed us right to the hilt of learning...I never would have had the guts to go into biophysics without the grounding in science and mathematics that I got at Rensselaer."
If your beer has been tasting better lately, or if your vitamins have been giving you more bounce, perhaps it is due to improvements in their formulation that have been made by Joseph A. Kardys, '50, M.S. He is presently a Senior Development Chemist with Pfizer, Inc. He has had 30 years experience in Vitamin A research and with the various processes associated with vitamin production.

Joseph Kardys received his Bachelor's Degree in Chemistry from Connecticut State College in 1948, in an educational process that was interrupted by service with a Naval Construction Battalion overseas. While he was doing graduate study at Rensselaer, he also served as a full-time teaching assistant. Upon receiving his Master's Degree in Chemistry, he joined the Pfizer organization, and has been with that company ever since. At Pfizer he continued his studies with seminars in organic chemistry, advanced physics, and management.

He has been in charge of quality control and process development in Pfizer's organic production department. He has developed economical processes for the manufacture of antibiotics and fine chemicals, processes for the encapsulation of unstable vitamins and drugs, and for the formulation of pharmaceutical and agricultural multivitamin products.

The United States Patent Office has issued Joseph Kardys' six patents for Retinoid Encapsulation and Stabilization of Vitamin A and Vitamin intermediates, and he has developed for Pfizer at least 10 different encapsulated retinoid products. One of his high potency multivitamin cold water dispersible formulations forms the
basis for over 30 custom formulations. He also holds two patents not associated with Vitamin A.

Joseph Kardys is one of hundreds of dedicated scientists at the cutting edge of new knowledge. His expertise is helping all of us to live healthier and more enjoyable lives, and it is establishing a sound foundation of knowledge for others to build on.
In 1973 a headline in an Oslo newspaper read, "Master in billiards and bridge, almost flunked physics - gets Nobel Prize." It was referring to the award of the Nobel Prize in Physics to Ivar Giaever who shared it with Leo Esaki and Brian D. Josephson. Giaever was awarded the Ph.D. degree from Rensselaer in 1964. The Nobel award was for his development of a simple and direct experimental method of detecting and measuring in superconductors a quantity known as the "energy-gap," a principal feature of the theory of superconductivity which led to new discoveries in the understanding of electron "tunneling."

In his Nobel Prize address Giaever spoke of his "struggles with quantum mechanics" at Rensselaer with Professor Huntington. He also mentioned that it was rather strange to get paid for what he considered having fun, "but," he said, "like quantum mechanics, you get used to it."

Ivar Giaever was born in Bergen, Norway, and he received a degree in mechanical engineering from the Norwegian Institute of Technology in 1952. In 1954 he immigrated to Canada where he joined Canadian General Electric's Advanced Engineering Program. He came to the United States in 1956 and worked as an applied mathematician for General Electric before joining its Research and Development Center in 1958.

Dr. Giaever has been the recipient of many awards. In 1965 he received the Oliver E. Buckley Prize from the American Physical Society. The National Academy of Engineering gave him the Valdimir K. Zworykin Award in 1974. He was elected to the Norwegian Academy of Sciences, the U. S. National Academy of Sciences
and the U. S. National Academy of Engineering. He is an honorary member of the Norwegian Academy of Technology and an honorary member of the American Society of Mechanical Engineering.

Since his Nobel award Dr. Giaever has turned his attention to problems in biology for several reasons. He points out that people do their good work when they are learning. "When you get the idea that you know it all, or even when others think you know it all even if you know you don't, it's time to switch your field."

Dr. Giaever points out that you can experiment in biology with very simple equipment; "whereas, in most solid state physics problems you need sophisticated equipment." Things are very different in biology, he adds, "There are an enormous number of problems waiting to be solved. Take memory, for example. There's a mechanism there, but nobody knows what it is."

As to the flash of insight he received in his "tunneling" experiments, Dr. Giaever said, "One day in Professor Hill Huntington's class, the new BCS theory of superconductivity came up that dealt with the "energy-gap" in a superconductor. It was obvious to me right away that if I could tunnel into a superconductor having an energy-gap I should see a large effect from that energy-gap. I knew that I had found the experiment that I was looking for."

Ivar Giaever credits the atmosphere of the G. E. Research Laboratories and his colleagues for much of his success. "When I had a question about a problem," he said, "I just had to walk down the hall to find someone who usually had the answer."
Architects

In 1976 Donald J. Stephens '40 B.Arch. was elected to the American Institute of Architects College of Fellows. (About four percent of the Institute's membership are elected Fellows.) He had served on its Board of Directors from 1974 to 1976 and was a member of its Commission on Professional Practice.

Don was a good student at Rensselaer. His graduation thesis won a prize, and he was elected to full membership in Sigma Xi. He also was awarded a graduate fellowship. After serving as an architectural engineer with the Watervliet Arsenal, Don entered the U. S. Navy where he received training in electronics maintenance. Upon leaving military service, he entered the architectural office of Architect Henry L. Blatner of Albany as an associate, where he remained for ten years. In 1956 he established his own architectural office and, in 1964, he entered into partnership with Ronald Rucinski. The firm's first name was Donald J. Stephens Associates being changed later to The Stephens Associates P.C.

Clients of Stephens Associates have included RPI, the State University of New York Construction Fund, Dormitory Authority--State of New York, United States Postal Service, Saratoga Retirement Center for the Methodist Church, Blue Cross of Northeastern New York, the New York Telephone Company (from which Don Stephens earlier had won three awards for design excellence), The Salvation Army, Albany College of Pharmacy, National Commercial Bank and the Capital Newspapers.

One of Don Stephens major interests has been in the
establishment of fair practices in the Architectural profession both in regard to the architect's compensation and in the protection of the client against undue costs or poor design and workmanship. As early as 1973 he played a major role in the publication by the New York State Council on Architecture titled "Cost Base Compensation Guidelines for Architectural and Engineering Services." The following year he became a member of the American Institute of Architects' Task Force on Compensation Management Guidelines. As a result of the work of this Task Force, Don helped to draft a definitive document "Agreement Between Architect and Owner for Designated Services." In 1971 Stephens Associates was the second firm in the United States to install an AIA Computerized Financial Management System.

Despite the demands of his office and of the State and National Associations of Architects, Donald Stephens somehow finds the energy and the time to serve his community and local educational institutions. He was Chairman of the Taconic Valley Planning Association from 1967 to 1972, a member of the Berlin Central School District Board of Education, serving as President in 1971 and 1972; he was President of the Rotary Club of Menands and a member of Advisory Councils at both RPI and Hudson Valley Community College. The New York State Association of Architects named him the first recipient of the Matthew DelGaudio Award for outstanding committee leadership.
Frank J. Matzke '51, B.Arch. is a Fellow of the American Institute of Architects. He is presently Vice President of Technology and Programs of the National Institute of Building Sciences, Washington, D.C. At various times in the past, he has served as a consultant to public agencies, colleges and universities and regulatory bodies on methods to expedite the design and construction of physical facilities.

Before enrolling in Rensselaer's School of Architecture, Frank Matzke served from 1942 to 1946 in the Army of the United States as an infantryman, rising in rank to a First Lieutenant, Infantry. His service took him to New Guinea, the Netherlands East Indies, and the Southern Phillipines. He was awarded a Bronze Star and other battle decorations. Upon graduation, he received the Ricketts Prize for the best graduating thesis in Architecture and the AIA Silver Medal and he was elected to both Sigma Xi and Tau Beta Pi.

After service with a private architectural firm for four years, he became an Associate Architect with the State University of New York. In 1962 he became Deputy Manager of Planning for the State University Construction Fund, and in 1968 its Deputy General Manager. In 1972 he joined the Public Buildings Service of the GSA in Washington as Associate Commissioner for Project Management. In 1975 he became Executive Director of the Illinois Capital Development Board.

He served as Chairman of the Management Resource Council 1974 to 1975, of the Building Research Advisory Board and as a Director of the Board from 1976 to 1979. He was Chairman of the
AIA national committee on Architects in Government in 1975, and was a Director of the New York State Association of Architects from 1966 to 1969. In 1974 he represented the United States as a member of its delegation at a 12-nation conference on Energy Conservation in Rotterdam. He chaired the session there on energy conservation in existing buildings and presented the GSA model building for energy conservation at a NATO conference on the same subject.

Frank Matzke has devoted his career to improving the management of design and construction of large building projects, and he has spent much of his talents and time trying to break the inertia and red tape barriers, which are almost as difficult to crack as the sound barrier. Many of his public presentations have been about "Fast Track," a system for expediting the delivery of public facilities. Apparently there are others who are concerned about this question as he is because he has been asked to speak on this subject to a variety of groups at many places throughout the world.

When he wasn't working at his profession or badgering contractors to work better and faster, he could usually be found sliding down snow-covered mountains. He was a national ski patrolman and a past patrol leader of the O.C. Ski Club ski patrol. More recently, he has devoted his free time to sailing his 32 foot sloop "Fantasy" on the Chesapeake Bay.
Donald J. Williams '52, B. Arch. has attempted to apply the principles and standards of architecture to area and community development. For his efforts in 1965 he received the Clearwater, Florida, Community Distinguished Service Award.

After graduation in 1952, Don worked for a time as an engineer for North American Aviation Corporation. He then worked for architects with offices in New York City and Port Jefferson, Long Island, before going to Florida in 1956.

In Florida he worked as an architect in the firm of Wakeling and Levison before forming a partnership with Edward H. Walker, Jr. in 1971. One year after he became associated with Wakeling and Levison, he was appointed chairman of the area beautification and development committee, an interest which he continues to maintain.

The firm of Williams and Walker has served as architects and construction supervisors for more than $300 million in construction since it was formed. Among its notable structures are the Clearwater City Hall and the Clearwater Times Building, which serves as one of the few privately funded Laboratories for the study and advancement of energy technology. Estimates indicate that this structure with its solar panels and its various devices to utilize energy from the wind cost about $300,000 more than a conventional building, but that it will effect a saving of at least $24,000 a year in operating expenses, or a return of about 8% on the additional cost.

Don's interest in civic affairs got him elected to two terms as a member of Clearwater City Commission. As a commissioner
he initiated the adoption of population density standards for land use, brought about a city-wide tree preservation program backed up by the creation of city tree farms, worked for the development of sound barriers and green belts along major highways and partially succeeded in preserving land populated by wild-life from being taken over by developers.

Don Williams also served as Chairman of the Central Pinellas Transit Authority, where he worked for a better public transportation system. In recognition of his success in improving the quality of life in Clearwater, he was elected President of the Suncoast League of Municipalities, composed of about 75 communities.

In 1973 Donald Williams received the Florida Association of Architects Community Service Award. In 1975, he was elected a Fellow of the American Institute of Architects, and the Florida Central Chapter of AIA awarded him a Medal of Honor. The civic beautification work which he pressed in Clearwater has been cited by the Sears Foundation, the Nurseryman's Association, and the Petroleum Institute. Don continues to work for the betterment of Clearwater and the Suncoast, but don't you think about moving there. The apartment vacancy rate is only about 1%.
J. Robert Gilchrist '52 M.Arch. is an articulate spokesman for his profession of Architecture. He believes that no matter how much money the Federal Government pours into the inner cities to restore them, they will fail miserably unless the dignity of the residents is the prime consideration. "The government has spent millions of dollars on huge, dehumanizing apartment houses. They were sanitary storage units that overpowered the people in them," he stated in an interview shortly after he had been elected President of the New Jersey Society of Architects.

Since opening his own office in 1955 he has designed over 700 buildings, including churches, schools, offices, industrial plants and laboratories. From this wide experience, he believes that it is necessary "to have that certain instinctive feeling toward one's profession, especially in those times when neither experience nor education can provide the proper answer. It would be unwise for anyone to pursue a profession (particularly architecture) wherein one has no native ability nor natural instincts."

In the course of his work Robert Gilchrist has won numerous awards and citations. Among them were three New Good Neighbor Awards for Design, the American Concrete Institute Award for creative use of concrete, Arts Council of Bergen County award for architectural aesthetics, two Horizon Home Competitions, and a citation from Architectural Record Magazine. In addition he won a New Jersey Society of Architects Award for outstanding design for hilltop townhouses.
He has written articles on the building and architectural professions that have appeared in the New York Times, the Architectural Record, Progressive Architecture, House and Home Magazine, the New York Construction News, and various New Jersey publications.

As President of the New Jersey Society of Architects, Gilchrist urged his colleagues to focus their attention on what he called emerging practice that provided avenues other than design for architects "such as environmental protection, planning, energy, development of the use of new products for architecture."

Robert Gilchrist has three sons, all studying to prepare themselves for some phase of architectural work. His advice to them was, "No matter how bleak the times, or how difficult the circumstances, there is always room for a good man. Be that man."
Lawrence P. Melillo '54 B.Arch., '57 M.Arch. has recently completed a Disaster Assistance Policy Statement and a Disaster Assistance Manual for the American Institute of Architects. With the annual toll of destruction from tornadoes, hurricanes, explosions and other man-made catastrophes, it is reassuring to know that someone has formulated plans for assistance and reconstruction.

After graduating from Rensselaer, Lawrence Melillo spent two years as an officer in the Army Corps of Engineers in the Arctic Regions of Alaska and Canada, building radar stations. He then returned to Rensselaer to study for his Master's degree, which he received in 1957. He is President of L.P. Melillo, PSC & Associates, Architects. He is also a member of the Board of old Bardstown Distilling Company and of Martin Enterprises Inc., Beverage Distributors and he is President of Rivermain, Inc. - Real Estate.

Lawrence Melillo's Architectural practice is geographically extensive, including the states of Kentucky, where he resides, and the District of Columbia, Indiana, New York, Ohio, Tennessee, and West Virginia. He has also a diversified practice in the fields of Architecture, Urban Design, Planning, Graphic Design, and Landscape Architecture. He gave a lecture at Rensselaer on his practice under the sponsorship of the Alcoa Lecture Series.

He has lectured widely and he has written articles for professional magazines, trade journals and local Louisville publications. He also collaborated on a book titled "Old Louisville." His current interests lie in the fields of Urban Design and Energy Conservation and, in these fields, he has collaborated in projects

Lawrence Melillo was former National Chairman of the Regional/Urban Design Assistance Team Program of the American Institute of Architects. He is a member of Tau Beta Pi and, in addition to his membership in his professional local, state and national societies, he is a member of the Kentucky Historical Society.
When John H. Griffis '55, B.Arch. was an All-American Lacrosse player at Rensselaer, he was known to be a good student and a promising architect, but it would have been difficult to have foretold that he would be the architect for a mosque in Dar-es-Salaam, Tanganyika.

Upon graduation, John served a hitch in the Marine Corps as a lieutenant. He then joined Architects' Collaborative in Colorado. While with that group, he won a Fulbright Fellowship for the study of baroque architecture in Germany. Upon completion of that study, he worked with the U. S. government in the remodeling and modernization of its European Airbases. On assignment, he also assisted in the remodeling of Orly Airfield in Paris, one of the world's busiest airports.

He then went to Rome to form the architectural firm of MacMillan and Griffis. One of John's major assignments in that partnership was the design of a governmental and an educational complex in Lagos, Nigeria. Although the partnership is no longer in effect, John Griffis still maintains an office and staff in Lagos. His main office remains in Rome.

Mr. Griffis has recently been involved in the design and construction of government buildings and hospitals in Tripoli. (Could it be an echo from his Marine background?) He is also deeply involved in the restoration of baroque architecture in Costa Esmeralda in Sardinia. This effort is known as Project Porto Giava and is financed by the Aga Khan. To enable him to carry out his far-flung African and Mediterranean projects, he maintains an office on his yacht! He thus joins Chauncey Starr in the glamorous occupation category.
As a young man Bernd Foerster '57 M.Arch. worked for the Government of the Netherlands. He received his Master's degree in Architecture in 1957 from Rensselaer after having been awarded a Bachelor of Architecture degree from the University of Cincinnati in 1954. That same year, 1954, he joined the Rensselaer Architecture faculty as an instructor in Architecture, rising through the academic ranks to a Professorship in 1965.

In 1971 Bernd became Dean of the College of Architecture and Design at Kansas State University, a position he continues to hold as well as a professorship in the same College. He has written four books and is the author, producer, and director of four films. The books were: Man and Masonry 1960, Pattern and Texture 1961, Architecture Worth Saving in Rensselaer County 1965, and Independence, Missouri 1978. His films were: Man and Masonry, 1961; What Do You Tear Down Next? 1964, Earth and Fire, 1964; and Assault on the Wynantskill, 1967. As might be expected from the foregoing titles, he is a member of the Sierra Club.

Bernd Foerster was President of the Rensselaer Council for the Arts in 1963 to 1964 and 1966 to 1967, and the Manhattan, Kansas, Arts Council in 1976 to 1977. During the 1960's he also served as a consultant and carried out surveys for the New York State Council for the Arts. From 1967 to 1971 he was a member of the Board of Directors of the Albany Institute of History and Art, a consultant for the Albany Historic Sites Commission, and a Trustee of Olana Historic Site. From 1968 to 1971 he chaired the Governor's Advisory Committee on Historic Preservation in New York State. In 1968 to 1969, he was Vice President of the Mohawk-Hudson
Council on Educational Television. In 1979 he was President of the Kansas Society of Architects AIA. He is presently Chairman of the Manhattan, Kansas, Downtown Redevelopment Advisory Board.

Bernd Foerster has been a force in the attempts to preserve our cultural heritage and our cultural and physical environments. He has given his students and the interested general public a greater awareness of the evolution of values in form and design, and he has striven to make our environment healthier and more enjoyable.
The AIA Journal for October, 1978 featured a summer residence that Peter Q. Bohlin '59 B.Arch. designed for his parents. It was but one of some forty citations that have been made to the firm of Bohlin and Powell, Architects, since the firm was founded in 1965. Richard Powell '59 B.Arch. will be remembered as an outstanding athlete at Rensselaer, starring in football and lacrosse. The partnership of Bohlin and Powell was founded and its headquarters are still located in Wilke-Barre, Pennsylvania.

In 1974 the name of the firm was expanded to indicate that it engaged in planning and engineering as well as architecture. In 1975 it opened a second office in Pittsburgh, headed by James Brown; and in 1978 the firm name was changed to Bohlin, Powell, Brown. Two more partners were added in 1979 with the opening of a third office in Philadelphia, and in 1980 the firm expanded to Bohlin, Powell, Brown, Larkin, Cywinski.

In addition to Peter Bohlin and Dick Powell, there are now six other Rensselaer graduates in architecture in the firm: Associates Russel B. Roberts '72, Jon C. Jackson '73, Frank W. Graham '73, and Project Architects Joe Salerno '73, Robert S. Lewis '73, and Margaret E. Bakker '76.

The firm took the first honor award of the Pennsylvania Society of Architects in 1973 for "Aquadome." The following year from the same Society, it won the Distinguished Building Award for the Westinghouse Medium Speed Elevator Division Building in Dover, New Jersey.

In 1977 the American Institute of Steel Construction gave the firm its Architectural Award of Excellence for its Coal Street
Park Ice Skating Facility. And in 1979 the firm won the Silver Medal for Design Excellence from the Pennsylvania Society of Architects for South Street Urban Improvements, Wilkes-Barre.

In 1980 the United States Department of Housing and Urban Development gave the firm Special Mention for Downtown Revitalization Project Design and, in the same year the Philadelphia Chapter AIA gave Bohlin, Powell, Brown, Larkin, Cywinski its Silver Medal for Design Excellence for the Norman Gaffney Residence, Romansville, Pa.

The firm thus has won awards in the three fields in which it specializes—Architectural Design, Planning and Engineering.
Michael D. Spear '63 B.Arch. is a leader in the "New Towns" movement in the United States. The object of this movement is to create social and physical environments that nourish the establishment of constructive human relationships, promote salubrious environments, and provide opportunities for a wide variety of leisure-time pursuits. From 1971 to 1978 he served as General Manager of the Rouse Company's Columbia Project, which with Reston, Virginia, is one of the two best known "new towns" in the United States.

The plans for the Columbia project are still being implemented. Columbia now has a population of nearly 50,000 people of the some 110,000 that are its planned objective. It consists of a regional downtown core and seven villages within a 20,000 acre tract, and as such it is the most ambitious, planned community ever attempted.

Michael Spear is presently Executive Vice President of the Rouse Company. In this capacity he is responsible for all of the company's development and consulting activities. This includes regional shopping center and downtown development, the work of the American City Corporation and the management of Columbia.

After graduating from Rensselaer, Mr. Spear earned a Master's degree in City Planning from the Harvard Graduate School. At Harvard he won the Sheldon Traveling Fellowship, a Mellon Foundation Fellowship, and the designation of "Outstanding Student" by the American Institute of Planners. He has served on the American Institute of Planners New Communities Task Force, and he has been a guest lecturer at numerous Schools of Architecture throughout
the Northeast. At Rensselaer he won the New York State Alpha Chi Rho Architecture Medal. He is a member of the Urban Land Institute New Communities Council.

Although utopias have been discussed since the beginnings of recorded history, The Rouse Company and Michael Spear are beginning to make them seem more of a future reality.
Edward P. Hamilton '07 was Chairman of the Board of John Wiley & Sons, publishers from 1956 to 1966. The "House of Wiley" is one of the oldest publishing companies in the United States, having been founded in the early 1800s and having published what has been called the first important American novel, James Fenimore Cooper's "The Spy." It was Ed Hamilton's uncle, Major William H. Wiley, RPI 1866, and President of John Wiley from 1904 to 1925, who directed the firm's concentration on scientific and technological books. He recognized the growing importance of scientific and technological knowledge and made John Wiley the vehicle for the preservation and transmission of that knowledge.

After graduating from RPI, Ed Hamilton worked as an engineer on hydro-electric projects until he joined John H. Wiley in 1914. He remained associated with that firm until his death in 1979, becoming Secretary in 1916, Vice President in 1925, President in 1941, and Chairman of the Board in 1956 and Honorary Chairman thereafter. His extensive travels throughout the United States, Latin America, Australia and New Zealand gave him a first-hand knowledge of the need for technological and scientific books in those places. He used that knowledge with his company and shared it with other publishers, becoming Chairman of the Foreign Trade Committee of the American Book Publishing Council.

Ed Hamilton was a bachelor and he, therefore, had the time to devote himself to three major outside-of-work interests—underprivileged youth, horse-back riding, and Rensselaer Polytechnic
Institute. He served as a Director of Kips Bay Boys Club for many years, and also served as President of the Board. The Club aids youth in the area of New York made famous or notorious by the "Dead End Kids." It has a membership of over 2000 boys.

Ed also served Rensselaer long and faithfully, applying his vast knowledge of significant trends in science and engineering and of people who were leaders in those fields. He was a trustee of Rensselaer from 1943 to 1962 and was President of the Rensselaer Alumni Association in 1945. Largely under his aegis, the School of Humanities and Social Sciences became established and Rensselaer developed into a technological university.

In 1975 Mr. Hamilton established the Edward P. Hamilton Professorship to recognize outstanding faculty members and to provide resources for the holders of the Professorship to engage in the development of new programs.

When he was a young man, he served three years in Squadron A of the New York Cavalry and in later years was an officer of a riding association near his country home in Katonah, New York. In World War I, he became a captain in the field artillery. In 1918 he was captured by the Germans in the Argonne Forest and was held prisoner until the end of the war. Often regarded by associates as a master of understatement, he summed up his imprisonment as an experience "having some unpleasant features."

Upon his graduation in 1914 he was elected a member of Sigma Xi. Perhaps a fitting description of Ed Hamilton would be that he was one of the finest examples of a scholar engineer.
When James E. Blackburn '23 ME was active as a Vice President of McGraw-Hill Publishing Company, he sent out 15 million letters a year. That was because he directed the circulation of thirty-three business and technical publications. These publications had a combined circulation of 800,000 and Jim was continually trying to increase that number. For years he was looked upon as being the most knowledgeable person in the field of mail order sales.

After graduation from Rensselaer in 1923, he started work as an engineer with Westinghouse Corporation. He soon decided that he was more interested in making engineering and technical knowledge generally available, and sought and obtained a job with McGraw-Hill in 1925. After a period of apprenticeship, he became circulation manager for three McGraw-Hill publications that included Engineering News-Record and Chemical Engineering. He then was promoted to supervise the company's mail sales and, in 1938, he was appointed circulation Director. In 1947 he was promoted to Vice President and he also became a director of the Company.

James Blackburn was one of the first to use extensive sampling and testing to determine the effectiveness of different types of sales letters, the best colors for these letters (green), the best day of the week to mail (Tuesday), the best length for effective sales (fairly long) and the best way to address the envelopes (by hand or machine--no real difference.) He called his job the engineering of direct mail. One of his important discoveries was that tastes and responses change very rapidly so that what is true one month may not be true the next. This knowledge called for
the ability to translate discovered preferences into fast action. He cautioned his associates not to place any reliance on year-old so-called "discoveries."

His ready willingness to share his knowledge with others made him much in demand, and he accepted between fifty and seventy-five speaking engagements a year. But with all of his various activities, he still found time to participate in RPI affairs. He was a member of the Public Relations Advisory Committee, the Alumni Advisory Council, the Alumni Fund Committee, and the Alumni News Committee, and my associates and I profited from his counsel.

His fellow mail sales directors elected him president of the One Hundred Million Club, so named because its members annually sent out a combined total of 100,000,000 sales letters a year, and he was also a director of the Audit Bureau of Circulations, an organization that was basic to the setting of advertising rates.

James Blackburn served as a Trustee of Rensselaer from 1949 to 1953. He died in 1979.
The Stephen Van Rensselaer collection in the Archives of the Rensselaer Library is the result of the dedication of Isadore Fixman '27 E.E. to Rensselaer Polytechnic Institute and to its founder. Fixman said of himself, "I was a poor, unknown Jewish boy and Rensselaer took me in and was good to me. 'Good' is certainly too weak a word." In return throughout his entire career "Fix", as he preferred to be known, was untiring in his efforts to assist Rensselaer. He was more than good to it. He served as President of the Rensselaer Alumni Association in 1963, and he was serving as a Trustee of Rensselaer when he was killed in an airplane crash in 1969. He had just sold his business, the Hub Electric Company, Incorporated, to the Westinghouse Corporation.

As much as he was a lifelong champion of Rensselaer, he was also a champion of causes to aid humanity. As a result he received two George Washington medals from Freedoms Foundation for Americanization and community programs. He was co-founder of Freedom Hall Museum, an institute of human relations in Oak Park, Illinois, where he lived. In Oak Park he served as a trustee of the village, and for the State of Illinois, he was a member of the Governor's Advisory Council.

At Rensselaer "Fix" was Alumni President of the Class of 1927 and a member of Phalanx, senior honorary society. But "Fix" is probably best known for his untiring fund raising activities in behalf of Rensselaer. He served as national general vice chairman for the 150th Anniversary Fund Drive. He was a life Patroon, a member of the Development Council, a member of the Annual Alumni Fund Committee, and an effective fund raiser for
special projects in behalf of the Department of Mathematics. But his special interest was the Stephen Van Rensselaer memorabilia and the Rensselaer Archives.

His wife, Fannabell, has carried on that interest, donating the Fixman Room and Collection in his memory, and serving as president of the Friends of the Rensselaer Library. She, herself, is a Life Patroon, and she is carrying out most effectively the beneficial work for Rensselaer for which her husband was noted. The Fixmans are a unique Rensselaer tradition and asset.
Samuel Josefowitz originally intended to become a concert pianist, but his father, who came to the United States from Lithuania in 1938 and who became head of a chemical company, The Sterone Corporation, persuaded him that the career of a concert artist was a risky business. Heeding his father's advice, Sam entered RPI, but he brought his piano with him and he practiced quite diligently while studying to become an Industrial Engineer. After graduation in 1942, he visited a friend in California who was starting a phonograph record business. The friend was having trouble obtaining a consistent quality from the then new synthetic plastic disks. Sam took a look at his operation and found a solution for him.

Meanwhile in New York City, Sam's brother, David, an accomplished violinist, had been experimenting with the mail-order sale of vitamins. Sam's experience with the record producing friend and both brothers' knowledge of the classical music world and leading musicians, led to their founding Concert Hall Record Company, which became a great success.

Gradually they expanded their sales of Concert Hall recordings to overseas, with David becoming based in Switzerland in 1958 and Sam following in 1965. From selling records by mail, they turned to selling books. They now sell about 14 million books a year in France, Switzerland, Great Britain, Australia, New Zealand, Israel and Japan. They are also experimenting with markets in Germany and Italy. In France they have over 600,000 subscribers, and Cercle du Bibliophile, their French Company, mails out 25,000 books a day. Their Company is Heron Books in Great Britain, Australia, and New Zealand. They continue in the classical record
business with Guilde Internationale du Disque.

To produce these books they own Edito-Service Publishing House in Geneva. It is claimed that 30% of all books exported from Switzerland are produced by this one publisher. Their book clubs are the largest in each of the countries in which they operate and especially so in Israel and Japan.

The Josefowitz watchword is quality. Sam, with his background in chemistry and industrial engineering, has developed imitation bindings that satisfy even the most demanding taste. The type design and printing are also of the highest quality, and yet the cost of even a 550 page volume like Darwin's "The Voyage of the Beagle" was under $2.50 in U. S. currency before recent inflation. A New York Times reviewer stated that it easily was the most impressive volume he'd ever had in his house. The brothers report that follow-up studies show that over 80% of the books that they sell are actually read and not merely used as decorations or conversation pieces.

Sam Josefowitz and his brother David, and their families live very secluded lives in Lausanne, Switzerland amidst a treasure trove of paintings and sculptures. They continue to play classical music for their own and their families' enjoyment, re-charging their batteries as they formulate plans to expand what they call their "integrated mail order" operation.
The Most Reverend Juan A. Arzube '42, C.E. is presently Auxiliary Bishop of the Los Angeles, California, diocese. He is the first native of Ecuador and certainly the first graduate in Civil Engineering from Rensselaer to hold such a post.

Juan Arzube was born in 1918 in Guayaquil, Ecuador. His father was a noted gynecologist. Wanting Juan and his two sisters to be exposed to a well-balanced education, his father and mother moved the family to England in 1927. There the children were exposed to the rigors and physical hardships of the prevailing style of British education. They stood it for four years, returning to Ecuador in 1932. In 1937 Juan graduated with a degree in philosophy from Colegio Vincente Rocafuerte. The following year he entered Rensselaer to study Civil Engineering, earning his degree in 1942.

Upon graduation Juan returned to Ecuador with a job as junior engineer with the Inter-American Public Health Service. In 1944, however, he went to Hollywood and found a job in radio as a master of dialects. He even starred in several radio productions. Then he became expert in dubbing Spanish voices into movies for distribution to Latin America.

In 1945, however, his whole life style changed as the result of a retreat he made at Malibu. There he felt an irresistible call to the church. After seven years of study for the priesthood at the Los Angeles Diocesan School, he was ordained in 1954. He was named Auxiliary Bishop of Los Angeles in 1971.

The Los Angeles Times once stated that "He has shown few signs of performing quietly in the background." Not long after he
was named Auxiliary Bishop, he officiated at a Mass for a jet-hijacker. "I have been asked why I am offering such a Mass," Bishop Arzube said, "I answer why shouldn't I? A Mass is not a reward for good behavior, but a way of petitioning aid from Almighty God. His family needs help, and the Mexican people for whom he did the hijacking need help." The reply is typical of the man. He says what he feels needs to be said. Once at an invocation at a Los Angeles Press Club banquet, he inserted a prayer that reporters concentrate less on sensational and disturbing news.

In regard for aid to the disadvantaged, he feels that there is need to build in them a sense of responsibility "providing them with the means for working out solutions to their problems, instead of giving them a prefabricated formula which only appeals to our mentality, our educational background and our standard of living."

Juan Arzube recalls that during his student days a friend of his who was not comfortable with the English language invited his girl friend to a dance at RPI. He told her, "This is a very formal dance," and then trying to indicate that she would need a formal dress, he added, "so please bring your night gown."

On a national level Bishop Arzube is a member of the following Committees of the Conference of Bishops:

- Ad Hoc Committee for the Spanish Speaking Campaign for Human Development
- Social Development and World Peace (Chairman of Sub-Committee on Health)
- Secretariat for Latin America (Chairman)
- Administrative Committee of Bishops
- National Advisory Council for Bishops
He's handsome, intelligent, wealthy, generous, travels around the world twice a year, is surrounded by beautiful women in his work, collects Napoleonic furniture, and drives a Ferrari. Not bad for an RPI 1945 Mgt.E. graduate, who tried mightily to stay away from the business he now excels in. His name is Malcolm Starr and his firm is Malcolm Starr, Incorporated, a world leader in high fashions for women.

When Malcolm Starr was a student at Rensselaer, he studied especially hard so that he would become a highly competent engineer and not be forced to go into business with his father, who operated a clothing business with moderate prices aimed at middle-aged, middle-class women. It was a good, conservative, minimum risk business.

After graduation, with nearly all A's, Malcolm Starr served with the U. S. Army Signal Corps at the European end of the trans Atlantic cable. He liked the job and intended to make a career of communications engineering. But his father's partner died, and he was needed to help straighten out the complications that ensued from the partner's death. Then his father died and he was left with the business. He says that he did an "engineering" analysis of the firm's prospects and decided to take the risk of moving it into the highly competitive high fashion field, dominated by Paris and French designers. In 1963 he and John Colling founded Colinda, Inc. in Hong Kong where they could make use of exquisite Chinese workmanship at prices that well-heeled buyers could afford. Then in 1966 he founded Gino Charles, a company that produced high fashion at low prices.
As a result of his market analysis, he realized that high fashion needed the world for its market, thus the founding of the preceding two companies. His aim was to sell the American Look to a world clientele. The result is that his firm now sells to 31 countries with offices in Zurich, Tokyo and Hong Kong, and he has increased the volume of business that his father was doing tenfold. He now has reached the point where he is regarded as an elder, well-established designer. His company sells to such well-known stores as Nieman-Marcus, I. Magnin, Saks Fifth Avenue, Lord and Taylor, and B. Altman. As befitting a man with world-wide associations, Starr speaks French, Italian, Spanish, and German with some acquaintance with a number of other languages.

Malcom Starr has been Chairman of the Patroons of Rensselaer, and he has made three research grants to the School of Humanities and Social Sciences. Understandably he was a member of Tau Beta Pi and Sigma Xi at Rensselaer.
On the main campus (of 122,000 student-body campus) of the Universidad Nacional Autonoma de Mexico stands Nezahualcoyotl Hall, North America's first "surround" concert hall. When his orchestra performed there, Lorin Maazel, music director of the Cleveland Orchestra, called the innovative structure "a great hall....permits individuality of instrumental timbre...embracing warmth." The acoustical design of the hall was the work of Christopher Jaffe, a 1949 RPI Chemical Engineering graduate. On November 26, 1977 the Christian Science Monitor said, "From now on, when the great concert halls of the world are mentioned, authorities may stumble over the name--Nezahualcoyotl--but they cannot pass it by."

After Jaffe graduated from RPI, he went to Columbia University where he studied theatre with Joseph Wood Krutch and Milton Smith. He then became a designer-producer for several off-Broadway productions. But financially the theatre offered him few rewards, so he took a position with White Metal Corporation in New York City. As Commodity Manager, he developed new applications for light metal wrought products. In 1958 he teamed with Boris Goldovsky of the New England Opera Theatre to test the acoustical properties of aluminum fibreglass reflectors.

In 1959 he founded his own firm Stagecraft Corporation to design, install, and tune full-stage symphonic enclosures, the first of which was evaluated at Tanglewood, the summer home of the Boston Symphony Orchestra. Said Charles Munch, the orchestra's conductor, "....I have never been so completely satisfied with an orchestra's quality of tone and clarity of ensemble..." Musicians were pleased to find an engineer with a theatrical background,
interested in music and the arts," Jaffe said. In 1962 Jaffe's reputation soared when President Kennedy had a Jaffe designed shell placed on the White House lawn for a concert by the Greater Boston Youth Orchestra. Throughout the sixties, Jaffe was acoustic designer and consultant for many of America's most prestigious orchestras. In 1965 he worked with the New York Philharmonic and the Metropolitan Opera to develop the historic New York City Parks Concerts, and later in the decade consulted with the Cleveland Orchestra, the St. Louis Symphony and the Chicago Symphony on a series of major music pavilions.

In 1971 Jaffe was the acoustician for the first 360-degree-seating symphonic pavilion, the Forum at Ontario Place, Toronto. The University of Mexico Hall was his first indoor 360-degree-concert hall. His first surround hall in the United States was Boettcher Hall in Denver, completed in 1978. The advantage of a "surround hall" is the intimacy it offers to large audiences where no one need be more than 85 feet from the performers.

Of interest to Troy, New Yorkers is the fact that Jaffe's acoustical design for Corson Hall at the Interlochen Academy combines his design for the Meadow Brook Pavilion, summer home of the Detroit Symphony, with the acoustic criteria of Troy Music Hall.

His present firm, Jaffe Acoustics, Inc. consults with architects not only on the design of concert halls and theatres, but also in attempting to make life less strident and discordant in offices, schools and public buildings. In helping to improve the listening experience of people, Christopher Jaffe has worked
with many of America's leading design architects.

Christopher Jaffe is past Chairman of the Acoustical Society's sub-committee on auditorium acoustics. In addition to his membership in the Acoustical Society, he is also a member of the National Council of Acoustical Consultants, the United States Institute of Theatre Technology, the Audio Engineering Society, and the American Symphony Orchestra League.

Mr. Jaffe was on the faculty at Julliard, and is a holder of eight U. S. patents on acoustical concert enclosures and reflective energy systems. He has presented or published over 15 papers to professional and technical societies.

In May 1980, RPI presented him with an honorary Doctorate of Engineering and appointed him adjunct research professor in the Department of Architecture for the school year 1980 to 1981.
Ronald K. Jurgen '50 is one of the new breed of communicators. He interprets highly specialized developments in electrical engineering and electronics to electrical engineers working in other areas of electrical engineering. Without people like him, the time gap between discovery, development and application of new knowledge would be considerably lengthened.

Ronald Jurgen graduated from Rensselaer in 1950 with a B.E.E. degree. After serving on the staffs of Industrial Electronics and Electronic Equipment with increasing editorial responsibility, he became editor of Electrical Engineering in 1962. His special fields of knowledge include electric power, instrumentation, medical electronics, and automotive electronics.

He is a Senior Member of IEEE and a member of the following IEEE Societies: Engineering in Medicine and Biology, Instrumentation and Measurements, Industrial Electronics and Control Instrumentation and Vehicular Technology. His interests, furthermore, extend to the Society for Information Display, of which he is a member, and he is also a member of the Association for the Advancement of Medical Instrumentation.

As senior Editor, Administration of Spectrum, Ron Jurgen is in charge of manuscript acquisition and manuscript review. As a relayer of information from the frontiers of knowledge and from the proving grounds of design and development, he performs a most important role in "the application of science to the common purposes of life."
After Gilbert Wechsler graduated from Rensselaer in 1962 with a Bachelor of Science degree, he went to the Yale School of Drama for graduate study. Then he went through a period of apprenticeship for off-Broadway drama productions and as lighting director for the Manhattan Festival Ballet.

In 1967 he was invited to design the lighting for Shadowplay (an appropriately named production for a fledgling lighting director) produced by the Royal Ballet at Covent Garden, London. The following year he designed lighting for the Broadway production of Staircase. He then designed the lighting for more than 25 ballets produced by the Harness Ballet in their tours of the United States, England, France, Holland, Italy, and Spain. He also designed productions for the Royal Winnipeg Ballet and the National Ballet.

Since 1970 he has been responsible for the lighting design of more than 40 productions of the Stratford Festival, another 24 for the Chicago Lyric Opera Company, and ten for the Metropolitan Opera Company. He presently serves as the lighting director for both the Metropolitan Opera Company and the Stratford Festival in Ontario, Canada.

He has also worked as lighting director and designer for a number of theatre companies including the Manitoba Theatre Center, the Vancouver Playhouse and the Guthrie Theatre in Minneapolis. For four seasons he was lighting designer for the Shaw Festival, Niagara-on-the-Lake.

As a young boy in Brooklyn, he played the piano and listened to the Metropolitan radio broadcasts, totally unaware that
someday he would be in charge of an integral part of the Metropolitan productions, applying technology to the arts.
While Steven Ross '69 B.S. was taking a semester off from RPI as the result of having failed two graduate level courses that were not necessary to his degree work in Physics, he learned that the Rensselaer Engineer, which he edited, had been named the best student-published engineering magazine in the United States by Pi Delta Epsilon, the Society for College Journalists. When he returned to Rensselaer, he became assistant editor of Sedimentary Petrology, published at Rensselaer and the most important journal in its field.

Upon graduation from Rensselaer, Ross enrolled at Columbia University where he earned his master's degree in Journalism in 1970. In addition to his professional editorial responsibilities, he now serves as an Associate in Journalism at Columbia where he teaches environmental and energy reporting.

For a short time in 1972 he was Associate Editor of Chemical Engineering magazine, a position which he left to become editor of New Engineer. Under his editorship New Engineer has become the most widely circulated interdisciplinary engineering magazine in the United States. It has more than 90,000 subscribers. Such success was a stepping stone to his becoming Vice President and Editorial Director of MBA Communications, the parent company.

In his position as Editorial Director, Ross has overall editorial responsibility for MBA's national consumer magazines: MBA, for business graduates, Juris Doctor, for young lawyers, Medical Dimensions for young doctors, and New Engineer, which he also personally edits, for young engineers. The combined circulation of these magazines total more than 500,000.
Steven Ross is also Director of Special Studies for Environment Information Center, where he created and continues to update the Environment Regulation Handbook. As anyone familiar with U.S. government regulations can well understand, this book now comprises more than 3,000 closely packed pages.

He is also a free-lance writer, having written seven books on environment and land control. These range in cost from $3.00 to $72.00. He is sought after as a speaker for technical societies, college audiences, and environmental and community groups.

Steven Ross is also Vice President of the Armstrong Memorial Research Foundation. The Foundation is named in honor of Edwin Armstrong, without whom modern radio broadcasting would be impossible. Armstrong invented the regenerative receiver, the superhetrodyne receiver, and frequency modulation together with FM stereo multiplexing. The Armstrong Foundation provides funding for annual awards in FM broadcasting and for technical lectures.

Ross chairs the annual awards committee of the National Society of Engineers for prizes for articles in the lay press about engineering. That Society honored him in 1975 with its Chairman's Award. In June 1978 the New York Society of Professional Engineers named him Citizen of the Year. (He resides in New Jersey.) He has been a Fellow of the American Chemical Society since 1973, and he twice won first place in the University of Missouri Business Press competition (1975-76 and 1977-78).
This chapter deals with eleven Rensselaer Alumni who served or are serving as Presidents of other educational institutions and with three alumni who as Professors are also members of the National Academy of Engineering.

Rear Admiral Norman Murray Smith graduated from the Naval Academy in 1906 and from Rensselaer in 1909. He was one of the first Naval Academy graduates to come to Rensselaer under a formal program started by Rear Admiral M. T. Endicott, a Rensselaer graduate of the Class of 1868. Endicott was the first Civil Engineering Corps Commodore and the first Rear Admiral heading the Navy Bureau of Yards and Docks.

Admiral Smith started his professional career in the Civil Engineering Corps of the Navy as an assistant civil engineer in the construction of the Great Lakes Training Station. He progressed through the ranks with a variety of assignments that included his serving as senior assistant to the public works officer in charge of the construction of the Pearl Harbor Naval Base. Then followed tours of duty as Public Works Officer in charge of construction at Naval Stations in Charleston, Santa Barbara, Norfolk and Boston.

In 1933 he was appointed Chief of the Bureau of Yards and Docks with the rank of Rear Admiral. He retired in 1937 but was recalled to duty with the Navy in 1942 as Officer in Charge of the Construction Battalion Replacement Center. During his Naval career Admiral Smith served as a builder of naval bases, yards, plants,
hospitals, air stations and harbors. Of interest is the fact that the Pearl Harbor Fleet moorings were built under his direction.

In June 1939 Rensselaer bestowed upon him the honorary degree of Doctor of Engineering, citing his excellence as an engineer and executive. His excellence as an executive was further demonstrated when he was asked to become the President of the University of South Carolina in 1945.

During the seven years of his presidency of the University of South Carolina, he helped the faculty raise academic standards, as evidenced by the accreditation of lagging schools and departments, he encouraged and promoted basic research, he inaugurated a system of sabbatical leaves for senior faculty members, he promoted faculty participation in professional societies and faculty attendance at national meetings of those societies, and he increased educational opportunities for younger faculty members. In other words he helped the University of South Carolina to adopt the same goals and practices that are found at leading universities throughout the United States. In view of the fact that he had been totally immersed in his duties as a Naval Officer and as a practicing engineer, it is noteworthy that his educational stance was progressive, enlightened and in the highest traditions of educational excellence.
William Gardner Van Note was born in March, 1906. He graduated from Rensselaer in 1929. Possibly unique among Rensselaer graduates, he served as president of two colleges - Clarkson Institute of Technology from 1951 to 1961, and Monmouth College from 1962 to 1971.

Interestingly and surely coincidentally he, President Houston, and President Low were all members of Delta Phi fraternity. Like so many other distinguished Rensselaer graduates he was a member of both Sigma Xi and Tau Beta Pi honorary fraternities.

Upon graduation from Rensselaer in 1929 with a degree in Chemical Engineering, he took a job as a metallurgist with Babcock and Wilcox. In 1931 he served as a teaching and research fellow at McGill University, following which he became an instructor in Chemistry at the University of Vermont, where he took his Master's degree in 1933. Upon receiving this degree he became associated with North Carolina State University, where he progressed through the ranks becoming Director of Engineering Research in 1946.

Periodically while at North Carolina State, he took leaves of absence for research and advanced study at Pennsylvania State University, earning a Ph.D. degree in metallurgy from there in 1941. While engaged in metallurgical research, he also became interested in the industrial applications of research and in closer liaison between university laboratories and industry. As a result of this interest he became one of the prime movers for the creation of the North Carolina "Industrial Triangle" which transformed this area from a rural community into a foremost exemplar of the results of
applied research.

As President of Clarkson he was instrumental in building a faculty that maintained close ties with industry in both basic and applied research. He also became active in the role of non-tax supported colleges and universities, becoming chairman of the New York State Commission on Non-Tax-Supported Colleges and Universities from 1956 to 1958. He also served as Vice President of the Association of Private Colleges and Universities in New York State in 1960-61 and President of a similar Association in New Jersey in 1967. He was Vice President of the New Jersey College Fund Association from 1965 to 1969.

He is the author of numerous articles in the fields of metallurgy and in the administration of engineering education. Like so many of his Rensselaer predecessors, he pursued a career that was a major force in furthering the education of students so that they could apply the progress in science and technology to the "common purposes of life."
On May 1, 1963 Dr. Ernest Notar, RPI '31, was named President of Niagara County Community College. This appointment culminated a career of service to public community education.

Dr. Notar was born in Buffalo, New York, and he spent his professional career in the vicinity of his native city. When he was a student at Rensselaer, he was a member of the Glee Club, the varsity football squad and the Transit Board. He was also a member of Phi Delta Kappa, national educational honorary fraternity.

After graduating from Rensselaer and working for a time as an engineer, he became associated with the Buffalo Vocational Schools program, serving as an instructor from 1936 to 1946, with time out for service in the U. S. Navy from 1943 to 1946. In 1946 he also earned the degree of Master of Education from the University of Buffalo, from which he was awarded a Doctor of Education degree in 1955.

He served as a Department Chairman in the Erie County Technical Institute from 1947 to 1955. Then he served as Dean of Erie County Technical Institute from 1955 to 1963. He was the first president of Erie County Community College holding office from 1963 to 1975. He was a member of the Association of Presidents of Community Colleges in New York State. The American Technical Educational Association, and the American Society for Engineering Education.
Ralph Carlisle Smith '31 Ch.E., former president of New Mexico Highlands University, is a man of many accomplishments. He has earned the degrees of doctor of philosophy and doctor of jurisprudence. During World War II, he served in the U. S. Army, first in the Chemical Warfare Service and then in the Corps of Engineers, Manhattan Project, rising to the rank of Lieutenant Colonel and winning the Legion of Merit and Army Commendation Medal. He has been elected to the honor societies of Sigma Xi, Tau Beta Pi, Phi Kappa Phi, and Order of the Coif. He is presently an educational consultant.

After graduating from Rensselaer, Smith worked as a chemical engineer with the Du Pont Company, 1931 to 1935, the United States Patent Office, 1935 to 1937 and Colgate Palmolive Company, 1938 to 1942. In 1940, he was admitted to the Washington, D. C. bar, and in 1946 to practice before the U. S. Supreme Court. From 1943 to 1946, he served as patent counsel and assistant to Dr. J. Robert Oppenheimer, director of the Los Alamos Scientific Laboratory of the Manhattan Project. Then in 1946 he became an assistant director of the Los Alamos Scientific Laboratory of the University of California, serving in that capacity until 1957. In 1961, he became a professor at New Mexico Highlands University, and from 1964 to 1970, he served in turn as graduate dean, academic dean, and vice president. He was appointed university president in 1970, remaining in that post until 1972 when he became counsel to the president.

From 1950 to 1955, Smith was county probate judge for Los Alamos, N.M. and was Republican candidate for Congress in 1956.
From 1964 to 1978, he served as chairman of the Las Vegas Planning Commission, as well as municipal judge in 1977. He was co-editor of the National Nuclear Energy Series beginning in 1951, and co-author of *The Effects of Atomic Weapons, 1950*, and *History of the Los Alamos Scientific Laboratory, 1961*, and is holder of patents in the chemical and nuclear fields. A member of numerous professional societies and a fellow of the American Institute of Chemists, he is difficult to characterize by any conventional label. A university president, a chemist, a judge and attorney, a professional engineer, a military man, and a public servant, he illustrates the wide range of opportunities that are available to a person with a sound education, an inquiring and perceptive mind, and a desire to serve one's fellow man.
Henry J. Parcinski graduated from Rensselaer in 1935 with a degree in Electrical Engineering. He has served as President of Trenton Junior College and School of Industrial Arts and as President of Alliance College. Much of his professional career in higher education has been spent in trying to provide educational opportunities for people of Polish descent.

In a report prepared for the Kosciuszko Foundation in 1974, he examined the difficulty that Polish students, both male and female, have in obtaining entrance to American Medical Schools. For instance, according to his report, in the City of Buffalo with a 20% Polish population, there was not a single Buffalo student of Polish descent attending the Medical School of the University of Buffalo, at the time of the report. The report also pointed out that former minorities that had suffered educational discrimination in the past are now being given preferential treatment when they apply to U. S. Medical Schools, especially women, Jews, and Blacks, but that Polish students continue to encounter admission difficulties. To help overcome this difficulty, Dr. Parcinski with the help of the U. S. State Department and the Polish government has arranged for U. S. students of Polish descent to be admitted to Polish medical schools provided that they can speak and understand Polish.

After graduating from Rensselaer, Dr. Parcinski became Chairman of the Electrical Engineering Department at the School of Industrial Arts. He also continued his studies at Columbia University where he earned a Master's Degree from Teachers College in 1947. From 1942 to 1946 he also served as a visiting Assistant
Professor of Electrical Engineering at Princeton University.

In 1946 he was elected President of Trenton Junior College and School of Industrial Arts, in which post he remained until 1963. He became President of Alliance College in 1963 and served until his retirement in 1972. In addition to his two college Presidencies, he has served as President of the New Jersey Junior College Association, as a Director of the New Jersey Association of Colleges and Universities, as a Commissioner of the American Association of Junior Colleges, and as President of the Junior College Council of the Middle Atlantic States. During World War II he served as a lieutenant in the U. S. Navy.

When he was at Rensselaer he was a well-known athlete, earning his varsity letter in baseball, basketball, and soccer. As a freshman he won the Bachelors of RPI Honorary Athletic Trophy Award.

In 1956 he was awarded the honorary degree of L. H. D. from Alliance College and in 1961 he was awarded the honorary degree of LL.D. from Rider College. He has been active in civic affairs, serving as President of the Trenton Polish Professional and Business Men's Club and as a member of the Mercer County Industrial Commission. He holds a professional engineer license from the State of New Jersey and he serves as a representative in the Small Business Association of Northwestern Pennsylvania. As President of Alliance College, he initiated the Alliance College Junior Year Abroad Program with the Jagiellonian University in Krakow, Poland.
Thomas Samuel Leary '38 B.Ch.E. is President of McNeese State University, Lake Charles, Louisiana. He earned a Master of Science degree from Rensselaer in 1939 and a Ph.D. degree from Iowa State University in 1942.

After receiving his doctorate, he became an engineer with the Holston Ordnance Works in Kingsport, Tennessee, rising to the position of superintendent. After two years with Stromberg Carlson Company, he became chief development chemist for the American Cyanamid Company. From 1955 to 1961 he was manager of the research laboratories of the Cities Service Oil Company in Lake Charles, Louisiana. He then joined McNeese State College as a professor and head of its engineering department, serving in those capacities from 1961 to 1969. In 1969 he became President of the University.

He is a consulting engineer to Ernest Levingstone & Associates, a member of the Board of Directors of the McNeese State University Foundation, and of the W. T. and E. L. Burton Foundation. He is also a director of St. Patrick's Hospital. He was elected a Fellow of the American Institute of Chemical Engineers and to membership in Sigma Xi. He is a contributor of articles to professional journals and a patentee in the field of chemical engineering.
Dr. Eduard Pestel was born in Hildesheim, Germany in May 1914. Since 1969 he has served as Rector (President) of the Technical University in Hanover, Germany. He received his Master of Civil Engineering degree from Rensselaer in 1939. He also received the Honorary Degree of Doctor of Engineering from Rensselaer in 1970.

From 1942 to 1946 he served as Head of the Engineering Division of Leybold, K. K. in Osaka, Japan. During the years 1946 and 1947, he served as Director of Planning and Research for Kinzoku Kogyo K K., Osaka.

Returning to Germany from Japan, he earned his Doctor of Engineering Degree from Hanover Technical University in 1947 and the Doctor of Science degree from the same institution in 1950. From 1948 to 1951 he served as Deputy Director of Mechanics at Hanover. In 1960 he was appointed associate professor, and in 1967 full professor and Director of the Institute of Mechanics. From 1961 to 1962 he served as Dean of the Faculty of Mechanical Engineering, and in 1962 to 1963 as Visiting Professor at the University of California at Los Angeles. He was elected Rector of Technische Universitat, Hanover in 1969.

Professor Pestel's main work has been in the fields of general mechanics, mechanical vibrations, and matrix methods in elastomechanics and biomechanics. He has published over 50 research papers and has published books on Automatic Control, Advanced Elastomechanics, and General Mechanics.

He is a member of the Scientific Council of the German Computing Center, Darmstadt, and serves as German delegate in the
He is a member of the senate and of the Board of Directors of the German Research Society, and he is also a member of the board of trustees of the Volkswagen Foundation.

He has served as Secretary of the Club of Rome. He also headed a commission for the establishment of the International Institute for the Management of Technology. He has lectured widely on the need to manage technology, energy, and natural resources. He was one of the first to view with concern the unbridled consumption of energy and natural resources and to caution against uncontrolled industrial expansion.
"The secret of a good college," according to Thomas L. Martin, RPI '42, "is the men who teach the classes and handle the research." Tom Martin should know. He has been Dean of Engineering at the University of Arizona, of the University of Florida and of Southern Methodist University. Since 1974 he has been President of Illinois Institute of Technology and of the Illinois Institute of Technology Research Institute.

He graduated from Rensselaer in 1942 with a degree of Bachelor of Electrical Engineering. Then followed a tour of duty as a radar officer in the Signal Corps of the Army of the United States with highest rank as captain. He returned to Rensselaer to study for his Master's degree in Electrical Engineering which he was awarded in 1948. During his graduate study he also served as an instructor in Electrical Engineering. He earned his Doctor of Philosophy degree from Stanford University in 1951, and Rensselaer awarded him an honorary Doctor of Engineering degree in 1967.

He served as Dean of the College of Engineering at the University of Arizona from 1958 to 1963, Dean of the College of Engineering, University of Florida from 1963 to 1966, Dean of the Institute of Technology, SMU from 1966 to 1974. His special field of expertise deals with electronics and communication systems. He originated the first large educational talk-back television system in Florida in 1964, a system which spawned the development of similar systems throughout the U. S. A.

He has served as a consulting editor for two publishing houses and has contributed an article to the Britannica Review of
Developments in Engineering Education. From 1960 to 1961 he was editor of the Graduate Studies Division of ASEE. He is the author of six books and numerous articles for professional journals. Some of these and some of his books and reports have intriguing titles such as: Strategy for Survival, Malice in Blunderland, Dis-Service Courses, Engineering is Getting Tougher, Thermonuclear Targeting Theory, and Engineering Education for Hostile Environments.

Dr. Martin has served as a consultant for university, state and federal surveys of engineering education. He has also served as a member of the Board of Directors of the Dallas-Fort Worth Airport during its construction and as Chairman of the Construction Committee. He was a member of the Commission on Education of the National Academy of Engineering.

In 1972 he was elected to the National Academy of Engineering, and he served as Chairman of the Committee on Minorities in Engineering of the National Research Council from 1977 to 1979. He is also a member of the Board of Advisors for Science and Technology to the Prime Minister, Republic of China, Taiwan.

He is or has been a member of fifteen corporate boards, and he has been active in public service in Arizona, Florida, Texas and Illinois. He holds three U. S. patents. And like so many graduates of Rensselaer who have distinguished themselves, he was a member of Sigma Xi and Tau Beta Pi.

He received the Bronze Star Medal of the U. S. Army in 1945 and he has been cited for his outstanding service to the engineering profession by the Florida Engineering Society, the Dallas section of the Institute of Electrical and Electronic Engineers, and by the Tucson electrical industry.
Charles J. Merdinger '45 B.C.E. is a modern exemplar of the ideals of the Renaissance man, meaning an extremely well-rounded individual. This in some facetious minds immediately brings up the image of an over-weight person, but Charles Merdinger is over-weight only in the variety and excellence of his accomplishments. He has had a distinguished career in the U. S. Navy Civil Engineer Corps, attaining the rank of captain. He has been a director of a Research and Development Laboratory, a head of a university English, History and Government Department, a college president, a vice president of an Institute for Humanistic Studies, and Deputy Director of an Ocean Research Institution and, while at Rensselaer, an All-American lacrosse player.

Upon graduation from the U. S. Naval Academy in 1941, he was assigned as assistant fire control officer aboard the USS Nevada, which was sunk during the Japanese attack upon Pearl Harbor. Then followed a tour of duty in both the Atlantic and Pacific oceans aboard the USS Alabama during the early years of World War II. In 1944 he was sent to Rensselaer for special studies, and in 1945 was transferred from line to the Civil Engineer Corps. He received his Bachelor of Civil Engineering degree in 1945 and his Master of Civil Engineering degree in 1946. Then followed a construction assignment in Panama during which he was awarded a Rhodes Scholarship with additional duty in the Office of the Naval Attaché in London. In 1949 Oxford University awarded him a Doctor of Philosophy degree. Later, he was assigned design, construction, and public works duties in Washington, D. C., Puget Sound, Alaska, California and Japan. During this period he was in charge of building the Navy's first
master jet air station. In 1962 he returned to the Naval Academy as head of the Department of English, History and Government. In 1967 he was back overseas in the combat zone as head of the Navy's largest public works organization, a 4,500 SeaBee civilian outfit headquartered at Da Nang, Vietnam.

In 1970 Charles Merdinger became president of one of the nation's oldest colleges, Washington College in Chestertown, Maryland. During his presidency of Washington College, 1970 to 1973, the budget was put back into the black, three new college buildings were erected, an M.A. program initiated, the college re-accredited, and a foreign language and writers' houses established.

From 1973 to 1974 Dr. Merdinger was Vice President, Aspen Institute for Humanistic Studies, studying the feasibility of establishing 10 to 15 regional "Aspens."

In 1974 he became Deputy Director, Scripps Institution of Oceanography, a post from which he retired May 1, 1980. The Institution operates a multi-disciplined program of world-wide ocean research, teaching, and public service as an organization within the University of California at San Diego.

Dr. Merdinger is the author of the book, Civil Engineering Through the Ages, and he was the recipient of the 1972 History and Heritage Award of the American Society of Civil Engineers. In 1961, 1957 and 1951, he received the Toulin Medal of the Society of Military Engineers for the best published article of the year, and he has received various awards including the Legion of Merit with combat "V" from the U.S. Government. These awards were for services as Head Public Works Officer on the West Coast and in
Viet Nam, and from the Japanese Government for "people-to-people" services. He contributed the article "Aqueduct" to the 15th edition of the *Encyclopedia Britannica*, and he has been a contributor to numerous professional publications.

He is a corporation director, a member of Sigma Xi, Tau Beta Pi, Chi Epsilon, and many professional societies.
Professor Hermann A. Haus, Rensselaer M.S. '51, is an authority on noise in electron circuits. Two of his three books deal with this subject. They are: *Circuit Theory of Linear Noisy Devices*, written in 1959 with R. B. Adler, and *Noise in Electron Devices* written with L. D. Smullin and also published in 1959.

Professor Haus was born in Jugoslavia in 1925. He attended the Technische Hochschule in Vienna in 1948 and earned his B.S. degree at Union College in 1949. He was awarded the Sc.D. degree from MIT in 1954. That same year he was appointed Assistant Professor of Electrical Engineering at MIT. In 1958 he was advanced to the rank of Associate Professor, and in 1962 he became Full Professor of Electrical Engineering.

During the year 1959 to 1960, he returned to the Technische Hochschule in Vienna as Visiting Professor. In 1968 he held the MacKay Visiting Professorship at the University of California at Berkeley.

He has served as a consultant to the Raytheon Company and to the Lincoln Laboratories, and he has also served on the advisory panel of the National Academy of Sciences for the Radio Propagation Laboratory of the National Bureau of Standards. He was a Guggenheim Fellow in 1959 to 1960 and he is a Fellow of IEEE.

Professor Haus was a member of the editorial board of the *Journal of Applied Physics* from 1960 to 1963 and he is presently a member of the editorial board of *Electronics Letter*. His third book, written in collaboration with P. Penfield, Jr. is titled *Electrodynamics of Moving Media* published in 1967.

He is a member of Sigma Xi and Tau Beta Pi. He is also a member of the National Academy of Engineering.
James K. Mitchell '51 C.E. was the first person to be certain that the moon was not made of green cheese. He served as Principal Investigator for the Soil Mechanics Experiment for Apollo Missions 14-17 and was responsible for all soil mechanics studies carried out during the Apollo missions to the moon.

James Mitchell's research activities have included studies of soil mechanics, various methods of soil improvement, physico-chemical phenomena of soils, the stress strain time behavior of soils, lunar soil mechanics, and in-situ measurements of soil properties. He is the author of more than 135 published papers and a graduate text, "Fundamentals of Soil Behavior" (1976).

After receiving his Bachelor of Civil Engineering Degree from Rensselaer, he earned master's and doctor's degrees in Science from MIT, receiving his doctorate in 1956. He then served as a soil engineer and as an officer in the Corps of Engineers of the U. S. Army. In 1958 he joined the faculty of the University of California and is presently Professor of Civil Engineering and Research Engineer. He was appointed Chairman of the Civil Engineering Department in 1979.

Professor Mitchell serves as a consultant on geotechnical problems to numerous organizations. He is a Fellow of the American Society of Civil Engineers, where he served as Chairman in 1971 of the Soil Mechanics and Foundations Division. He is a member of the Research Council on the Behavior of Expansive Earth Materials. He was Chairman of the Transportation Research Board Committee on Physico-Chemical Phenomena of Soils from 1966 to 1973.

He was elected to the National Academy of Engineering in
1976. He has received the Norman Medal, the Thomas A. Middlebrooks Award (three times) and the Walter L. Huber Research Prize of the American Society of Civil Engineers, the Western Electric Fund Award of the American Society for Engineering Education, and the medal for Exceptional Scientific Achievement from the National Aeronautics and Space Administration.
When Stephen Harris, Rensselaer '59, was granted a Guggenheim Fellowship for 1976-77, he elected to spend his sabbatical year from Stanford University with the Physics Department at Dartmouth College. His colleagues claimed that Dartmouth's reputation as a good skiing area had as much to do with his decision as the reputation of Dartmouth's Physics Department.

After graduating from Rensselaer, Professor Harris studied for his Master's and Doctor's degrees in Electrical Engineering at Stanford University, earning them in 1961 and 1963 respectively. He is presently Professor of Electrical Engineering at Stanford and, by courtesy, Professor of Applied Physics. His research has been in the fields of lasers, quantum electronics, nonlinear optics, and acousto-optics. Some of his research contributions have included the first demodulation of frequency modulated light, the invention of the FM laser, the operation of the first electronically tunable laser, and the first hologram in vacuum ultraviolet. He has also devised methods for switching atomic collisions on and off using laser radiation. His present interests are in applying these techniques to selective laser-induced collisions, to laser chemistry and to the development of soft x-ray radiation.

In 1965 he received the Alfred Noble Prize of the American Society of Civil Engineers. In 1973 he won the Curtis McGraw Research Award of the American Society of Engineering Education, and in 1978 he was selected as the recipient of the David Sarnoff Award of the IEEE.

Professor Harris is a Fellow of the IEEE, the Optical
Society of America and the American Physical Society. In 1977 he was elected to the National Academy of Engineering. He has published over 70 technical papers and he presently holds ten patents.
Joseph J. Bulmer, Rensselaer '51 brings to his position of President of Hudson Valley Community College a wealth of experience as a manager of nuclear operations and as a teacher of technological personnel. For twenty years he served as manager of various technical groups for the Naval Nuclear Propulsion Program. In this position he directed the design, performance testing and evaluation, and the nuclear analysis of five KAPL operating nuclear reactors and propulsion plants.

He graduated from Rensselaer in 1951 with a Bachelor's degree in Chemical Engineering. He received his Master's Degree in Nuclear Engineering from the University of Michigan in 1955 and his Doctor's Degree in Nuclear Engineering from Rensselaer in 1966. He holds a certificate from the Oak Ridge School of Reactor Technology and he has served as a lead instructor in Radiological Warfare at the Army General School, Fort Riley, Kansas.

In much of his professional life he has been associated with nuclear propulsion for the U. S. Navy and with the General Electric Company in its nuclear propulsion design and development operations. For the General Electric Company, he developed and initiated a new school for Nuclear Power Engineering for employees with graduate degrees. This school trains between 60 and 70 people a year.

Joseph Bulmer has served on the faculties of Rensselaer and Union College in their graduate schools teaching Nuclear Science and Engineering, and Nuclear Reactor Theory, attaining the rank of full Professor.

From 1970 to the present he has served as Vice Chairman
of the American Nuclear Society Engineering and Accreditation Committee, and from 1978 to 1980 he served as Chairman of the Industrial and Professional Advisory Committee of the Pennsylvania State University Nuclear Engineering Department.

He is a member of Sigma Xi and the New York Academy of Science, and he received the General Electric Management Award. He is the author or co-author of some 26 internal publications of the General Electric Company.

Joseph Bulmer is also a member of what sports writers call the Association of the Blind. From 1958 to 1975 he belonged to the International Association of Approved Basketball Officials; from 1967 to the present to the Capital District Football Officials Association, and from 1972 to 1974 to the LaCrosse Officials Association.

(Remember the author is a former Coach.)
Martin G. Abegg, President of Bradley University, received his Doctor's Degree in Civil Engineering from Rensselaer in 1960. After attending the University of Illinois for two years, he transferred to Bradley University from which he received his Bachelor of Science in General Engineering degree in 1947. He then received his Master of Science in Civil Engineering degree from the University of Colorado in June 1951. Throughout his career his major field of interest has been structures.

He joined the faculty of Bradley University in 1947 and progressed through the ranks of the Civil Engineering Department until he was appointed Professor of Civil Engineering and Chairman of the Civil Engineering Department in 1960. He became Dean of the College of Engineering at Bradley in 1963 and Dean of the College of Engineering and Technology in 1967. In 1970 he was appointed Acting President of Bradley University and in 1971 was inaugurated as President.

He was elected to Sigma Xi and Tau Beta Pi and to four other honorary societies. He is a Past President of the Peoria Rotary Club and a member of the Peoria Civic Center Commission.

Including President Houston and President Low, both of RPI, thirteen Rensselaer alumni in the present or immediate past have served or are serving as presidents of Colleges and Universities. In addition Dr. Warren Stoker, RPI '33, served as founder and first president of the Hartford Graduate Center, now an independent entity but, originally, a graduate division of Rensselaer. Thus Rensselaer is continuing its tradition of providing people who are serving as leaders in teaching "the application of science to the common purposes of life."
Alumni Presidents

Within the memory of people living today, three alumni have served as Presidents of their alma mater. They are: Palmer Chamberlaine Ricketts, 1875, Livingston Waddell Houston '13, and George M. Low '48. Under Director Ricketts, Rensselaer became known as educating a people for leadership in the development of industry, railroads and public works. Under President Houston, Rensselaer broadened its educational commitments, began the humanization of engineering education, and laid the foundations for graduate education and research. Under President Low, Rensselaer is educating students with a commitment to meet human needs using a minimum expenditure of energy, resources, and human effort. The key words are productivity and replaceability. All three kinds of efforts have been in response to national and world needs.

It was my good fortune to have known and worked with all three presidents. I was Head Proctor in the Freshman Dormitories under Director Ricketts, Director of External Affairs and Assistant to the President during President Houston's entire administration, and teacher and sometime advisor to President Low as well as writer of this book work under his auspices.

Palmer Chamberlaine Ricketts graduated from Rensselaer in 1875. Immediately upon graduation he was appointed assistant in mathematics and astronomy. In 1882 he was promoted to assistant professor and in 1884 he was named William H. Hart Professor of Rational and Technical Mechanics. While serving as a faculty member, he also did consulting as a bridge engineer, sanitary engineer,
and flood control engineer. He conducted research in the testing of materials. He obtained patents on electrical devices for the control of railroad equipment and he served as a Vice President of the Trojan Car Coupler Company.

With his experience as a teacher, and researcher, and a practicing engineer, he was admirably equipped to become Director of Rensselaer in 1892. The Office of Director was concerned with the leadership of the faculty and of the academic program. Final authority rested with the President of the Board of Trustees and the Prudential Committee, the executive committee of the Board. Thus it was not until 1901, when Director Ricketts also assumed the Presidency that he had any legal power over the Institute's affairs. His general popularity and his commanding presence, however, endowed him with real, if not legal power as Director, and he was known by this title rather than by the title of President throughout his leadership of Rensselaer.

The following editorial from the New York Times, December 12, 1934 commented not only about Director Ricketts' influence upon Rensselaer and the engineering profession, but also about his influence upon related professions.

PRESIDENT RICKETTS

The "rebuilder" of the oldest school of science and engineering in any English-speaking country, the Rensselaer Polytechnic Institute in Troy, is the distinction that belongs to Palmer C. Ricketts, a graduate, a member of its faculty for fifty-nine years and its president for thirty-three years. When founded in 1824 by Stephen Van Rensselaer it was designed to be "a school for the sons and daughters of farmers and mechanics," with a leaning toward agriculture, but in its development its greatest contribution has been the making of engineers.
Its graduates have been pioneers in many fields of engineering. It is of record that they have served with distinction on every great canal, that they have helped to design or direct nearly every notable bridge in the United States and that they have constructed or operated a major part of the railroad mileage of America. Though it is pre-eminently "the Alma Mater of Engineers" and has had a noteworthy part in serving this great city in its physical phenomenal growth and in furnishing professors for other schools of like character, it has enriched related professions.

President Ricketts not only built the new Rensselaer after the fire of 1904, giving it a great group of buildings on a spacious campus, he liberalized the scope of its curriculum without imperiling its technical and professional training. At the beginning of its second century he planned the establishment of a new department of arts, science and business administration, with new variant courses leading to the bachelor's degree and five and six year courses for higher degrees in engineering, including disciplines in the liberal arts, also pre-medical and pre-dental courses. These changes have given the Institute a more extensive cultural horizon and at the same time afforded new opportunities for intensive work in the increasing phases of engineering; and what he did at Rensselaer has influenced other schools.

The word engineer meant originally a genius, equating the unknown from the known by algebraic signs, evoking the seen from the unseen by divination of intersecting lines and even reaching into the infinite by computations that have their firm base in the finite. Engineers have been our modern Titans, but free—as the ancient Titan was not who sought to bring the fire to mortals—free to avail of all that the mind can bring forth to light for the advancement of the race of mortals. Engineers are peculiarly the men of the verges and in the death of Presidents Ricketts they have lost a great fearless pioneer and a wise leader. Atque omne immensum peragravit.

Editorial from "New York Times";
Wednesday, December 12, 1934.

This excerpt from the New York Herald-Tribune of September 8, 1929 illustrates the super quality of the Ricketts mind and of his ability to express with humor and clarity fairly obstruse
and philosophical ideas.

What is the intellectual life? Has any class or any individual a corner on it? Who is to determine whether a contemplation of, for instance, the marital vicissitudes of Henry VIII tends to greater intellectuality than the consideration of the conditions existing among the stars; the thought, for instance, of the globular cluster in Hercules consisting of at least 60,000 stars at a distance of 35,000 light years, more than two thousand billions of miles, away? . . .

The difference between savagery and civilization, between ignorance and enlightenment has resulted from improvements in means of communication and methods of transportation. And as the ages have passed the men of pure science and the engineers have been responsible for both our means of communication and our methods of transportation which have added enormously to the knowledge of all peoples and which have brought them more closely together.

Always these men have worked side by side to give those who are ignorant more light; to give those who are poor more comforts; to give those who are ill more health; to give many persons in many lands more leisure to work in their chosen fields; using their great intellectual powers that others, in other fields of knowledge than science, might join with them in the intellectual life. . . .

As the undisputed leader of Rensselaer, Director Ricketts like Presidents Eliot of Harvard and Butler of Columbia was a benevolent despot. The following anecdotes should give you some idea of the way he operated.

Leader of the Orchestra

I first met Philip Henry, Vice President of the Board of Trustees, a distinguished engineering graduate of the class of 1887, when he called on me after a Board meeting to congratulate me upon my being named head proctor in the Freshman Dormitories.
Mr. Henry said, "I mispronounced your name, Schmelzer. I was reading it on a slip of paper the Director gave me before the Board meeting this morning, so I thought I had better see you and apologize and get to know you so I wouldn't mispronounce your name again. You see, the Director carefully orchestrates the Board meetings so we won't get bored (pun intended). As we enter the meeting, he hands us little slips of typewritten paper telling us what motions to make and what we are to say when he calls on us. In that way the meetings run smoothly. We stay alert, wondering when we will be called upon, and the Director gets all the business accomplished in exactly the way he wants it. I'd like to see the look on his face if one of us put in an original motion. He'd probably have a stroke. Now don't misunderstand me; he's a very remarkable man and we all love him dearly, but he runs a very tight ship."

**The Prudential Committee Demurs**

In the 1930 era, all of the faculty including the instructors were required to attend and participate in faculty meetings. These meetings were presided over by Dr. Ray Palmer Baker, Assistant Director. Director Ricketts sat a little behind Baker and to his left—presumably to indicate that Baker was his "right hand" man. The minutia of student grades and student discipline were discussed by the entire attendance, and this was often a lengthy procedure, so lengthy, in fact, that often more important matters had to be deferred. Consequently some of the more influential Department Heads had gotten together and had agreed to submit a motion to do away with this procedure, letting it be handled by the Departments
themselves. Accordingly the motion was introduced, discussed briefly, and then passed unanimously. Whereupon Director Ricketts said, "That's all very well, Gentlemen, but I think you might find that the Prudential Committee would want these matters to continue to be handled just as we have been doing. Excuse me for a moment." The Director then arose, went over to a corner of the room in plain sight of all of us and mumbled something to himself. He then came back and took his seat. "No, Gentlemen," he announced, "the Prudential Committee does not approve of that motion."

No Parking

George Hahn '36 tells this story about P. C.

One day when he was late for a class, George parked his car on the campus. When he came out of class he found a note on the windshield of the car directing him to report immediately to Director Ricketts.

As George entered P. C.'s office, the Director called out, "What's your name".

"George Han."

"Do you know what that name means?"

"Yes, Director. It means rooster."

"Well, roost no more on the campus or I'll wring your neck."

Allure After Dark

Fred Sheldon '36 of Delta Phi fraternity tells of the time Director Ricketts asked him to come to the Director's office.

"Sheldon, I know it's summertime, but fraternity house rules still hold. I hear you've been having unchaperoned girls in
your fraternity house after dark. Don't you know that's against the rules?"

"Director, our house has a regulation that no girl is allowed above the first floor under any circumstances. Isn't that good enough?"

"Sheldon," asked the Director, "don't you suppose an attractive girl could seduce one of your brothers on the first floor as well as on the second? No unchaperoned girls in your house after dark, or we'll close it down."

Definition of a Gentleman

Isadore Fixman '27 told about one of his encounters with the Director. Near the end of his senior year, his class officers gave him the responsibility of arranging for the entertainment for Grand Marshal night. Traditionally that entertainment consisted in part of a performance by several local strippers. Iz, however, wanted something more professional, so he went to New York and hired a team of girls from Minsky's. That was his mistake because the local papers gave his "entertainment" quite a write-up with pictures. The predictable result was that Iz was summoned to the Director's office. "Fixman," bellowed the Director, "look at those clippings. Did you have anything to do with this?"

"Yes, Director, I did. In fact I was responsible for the whole show. I went to New York myself and hired the girls. No one else had any responsibility at all for it."

"I should kick you out and not let you graduate," the Director said, "but since you've been truthful about this matter and
have come right out and taken the blame like a gentleman, I'm going to let you off with some advice that I want you to pay attention to. Never let this kind of thing happen again at Rensselaer, but if it should happen, never, never let it get into the papers. I've had about a dozen phone calls this morning after those papers appeared. You must remember that society considers a gentleman to be a fellow who knows how to have his pleasures without their getting into the press. Good day."

Architecture Versus Civil Engineering

According to Assistant Director Ray Palmer Baker, P.C. could not comprehend the point of view of the faculty in the Department of Architecture. Raised in the Beaux Arts tradition, the faculty insisted upon free-hand sketching and "life studies." By this insistence, the architects did not strengthen their hands in freeing themselves from the necessity for certification by civil engineers as to the structural safety of the buildings which they designed and erected. The local controversy between the two departments was typical of the national battle which was going on. With his engineering background, Director Ricketts inclined toward the engineers' point of view. When he finally comprehended that "life studies" meant the sketching of nude models, he sighed to Baker, "I can't for the life of me see how being able to sketch a woman's belly button will make a student a better architect."

Student Air

Paul Conway of the Class of 1916, Rensselaer, told this story about how Director Ricketts captured his loyalty to the
Institute. One day Paul received a telephone call from Mr. Siple, Ricketts' Secretary and Assistant, telling Paul that the Director wanted to see him promptly at 2:00 PM at the Director's office. To make sure he was there on time Paul reported to Mr. Siple at 1:45 PM. There were other students waiting, and as they talked it appeared that they had all been called down to the Pittsburgh Building because of some deficiency in their studies or for some misdemeanor.

"What are you down here for?" Paul was asked.

"I'm not doing too well in Chemistry," Paul replied, "that's the only thing I'm really down in. But I had a bottle of beer in my room. Maybe they found that."

When it was Paul's turn to go in to see the Director, the Director greeted him with, "Professor Clark tells me you've been sleeping during his lectures. Don't you know it's an insult to a learned man to sleep while he's speaking words of wisdom? Clark's going to flunk you if you keep on sleeping in his classes. And you're already flunking Chemistry. I may have to fire you for a term. What have you got to say for yourself?"

"Director, I admit I've been sleeping in Professor Clark's lectures."

"He isn't that dull. What's the matter, aren't you getting enough sleep?" P. C. asked Paul.

"No, I'm not," Paul replied, "you see I work three or four nights a week as a bartender in order to make enough money to live on. I don't get through work until one or two o'clock in the morning and then sometimes I study for an hour. Clark's is the first class I go to in the morning, and I'm still half asleep."
"How much do you make a week."

"It varies, but I manage to make between $12 and $15 a week."

"Let's see," said the Director pulling out a roll of bills from his pocket, "if I gave you $150 for the rest of the semester, would you give up your job?"

"I sure would, Director, but I'd like to take the money as a loan. When I graduate, I'll pay you back with interest."

"Tell you what, Conway," the Director came back with, "if you don't sleep any more in classes and if you pass your courses, I'll forget that I ever loaned the money to you. Now don't take time to thank me. Get back to your room and get studying. Good day."

As Paul passed the waiting students in the ante-room, he looked so thunder-struck that they asked him if the Director had kicked him out of school.

"No," said the still-numb Paul, "he gave me $150."
President Houston

One day when I entered President Houston's office I said to him, "Ken Plant (Treasurer) and I have figured out you have now doubled Rensselaer's endowment. You remember you said that you wanted to do that before you retired." Houston's reply was typical. "I still have a few more things I'd like to do before I get out, so please let me hang around for a year or two more."

The door to his office was open, as usual, and there were several student leaders in the ante-room. The result was that a rumor spread around the campus that I had fired the President. No one enjoyed it more than "Liver" Houston.

The doubling of the endowment illustrates one of President Houston's great strengths. Actually the endowment almost tripled during his term of office. He not only helped Rensselaer to grow in financial resources, but he also helped other colleges—notably Union and Brooklyn Polytech. At least four of his six honorary degrees were bestowed in part for the financial advice which he gave to the bestowing institutions. Professor Seymour Harris, former head of the Economics Department at Harvard, in his book on Financing Higher Education devotes an entire chapter to Houston's imaginative and lucrative methods of investing endowment funds.

Livingston Houston was born in 1891 in Wyoming, Ohio. He entered Rensselaer in 1909 and he graduated in 1913 with the degree of Mechanical Engineer. He joined Delta Phi fraternity, and he was elected captain of both the basketball and tennis teams.
In his junior year he was also manager of the baseball team. Upon graduation he worked as assistant construction manager for the Mobil Gas Company, and then as assistant manager of inspection for the Griffin Wheel Company. During World War I he served with the First Illinois Field Artillery on the Mexican border and then in France as a captain in the US Army Ordnance Department. After the war he joined Ludlow Valve Company in Troy serving successively as production manager, factory manager, general manager, president, and chairman of the board. When he was 34 in 1925, he became the youngest person ever to be elected a Life Trustee of Rensselaer. In 1932 he was named secretary of the board of trustees, assuming the additional duties of treasurer of the board in 1935. In 1943 he was elected Executive Vice President of RPI, and on December 2, 1944 he succeeded William Otis Hotchkiss as Rensselaer's eleventh president. On March 1, 1958 he was succeeded as president by Richard G. Folsom, and he became Chairman of the Board, a position which he held until June 1963, the fiftieth anniversary of his graduation.

There were three distinct phases to the Houston administration. First, the rapid expansion of enrollment to accommodate returning war veterans; second, the physical expansion of the campus when it became evident that Rensselaer's continuing enrollment would stabilize at more than double its pre-war figures; and the reorganization of the academic administration into schools headed by deans and with a commitment to graduate education and research as important elements in Rensselaer's over-all educational program. The present Rensselaer is an outgrowth of this reorganization.

Rensselaer's 100th Anniversary Celebration in 1924 was an
ornament and a highlight in its history. But that celebration also caused Rensselaer to freeze into a mold. Eminent people from all over the world acclaimed Rensselaer for setting the pace in engineering education and becoming a force in world progress and welfare. Such acclaim had the effect of making Rensselaer highly resistant to change and adjustments in response to the developing capabilities of industry and society in general. Rensselaer, its people reasoned, had a good thing going for it. Why tamper with something that had won such universal approval?

Rensselaer's conservatism and resistance to change did not mean, however, that some of the faculty members and students were not receptive to new concepts and new discoveries. In fact, the Rensselaer of the 1920's was a pioneer in radio communication, in environmental studies years before they became widespread, and in metallurgy, as examples. Its faculty, however, was inbred, with Rensselaer graduates taking the place of Rensselaer graduates. And in the fields of research and graduate study, its sights were set at too low a level.

Director Ricketts' successor, William Otis Hotchkiss, was well aware of these conditions and he took steps to attempt to correct them, meeting with much opposition. He had the unenviable task of changing Rensselaer's direction and, like a cumbersome ship at sea, the ship responded slowly to the change in the rudder. Meanwhile students were being educated in an extremely sound but conservative, even old-fashioned manner, with a good grasp of the fundamentals of their professions, but from the examples of graduate achievements as cited in this book there is no evidence to support
the contention that their careers suffered.

Livingston Houston was not a professional educator, and he was well aware of that fact. Because of his business background, he did not readily accept the presidency of RPI. He considered himself an interested amateur in the field of education. I was present when he discussed his acceptance of the presidency with Dr. Matthew Hunter. "Matt," he said, "you've forgotten more about education than I will ever know about it. Yet they want me to become president of this place. I think I can help it financially and administratively, but I'm going to need help with the educational program and with student administration. If you and Baker (Ray Palmer Baker) would help me, I think I could swing it. I'd want you to take complete charge of the educational program as Dean of the Faculty and Baker to take complete charge of the students as Dean of Students. Baker says he will do it if you will do it. I'll be guided by you but, of course, I'll try not to let you get such an expensive faculty that we'll wind up in bankruptcy. Will you accept the position of Dean of Faculty?"

Thus there was established a team that set the stage for the present-day Rensselaer. But before that could be gotten to, there was much work to be done to enable Rensselaer to educate the hordes of returning service men who were clamoring for admission, financially aided by the GI bill. The first years of the Houston administration were occupied with obtaining the faculty and facilities to take care of the swollen enrollment.

These were times of stress, of long hours and hard work, but they were also times of creativity. The present Freshman
Dormitories were built, married student housing was obtained, West Hall, formerly Catholic Central High School, was purchased, and the Houston Field House was acquired from Navy Surplus. The auditorium in Amos Eaton Hall, converted during the war for additional classrooms, was rebuilt to house the Department of Mathematics. The St. Joseph's property adjacent to the campus to the south was acquired, and this formed the basis for the modern-day campus. Mason House, formerly St. Vincent's, and the House of the Good Shepherd property to the North were added, permitting Rensselaer to spread out in both a northerly and southerly direction. But the most important change was not physical and it had not received the attention which it deserves.

The need to recruit new faculty members enabled Rensselaer under Dr. Hunter's direction to surround its in-bred and sometimes obsolescent faculty members with bright, promising new faculty members who came from literally all over the world. They brought new outlooks, new ways of teaching and doing things, and new ideas to the campus. And their interaction with each other and with Rensselaer's "old guard" benefitted everyone. Their wild-eyed schemes were cut down to practical size and, like the laws of gravity, each body moved each other body, until there became a surprisingly effective amalgam. It was a time of change. Faculty members came and went -- to better jobs, to industry, to smaller puddles. The dynamism of adjustment to the GI's gave way to the dynamism of research and graduate education, and the new concepts which these generated filtered down to the undergraduates in their curriculum and in their voluntary attendance at guest lectures by invited
experts. In this way Rensselaer rejoined the mainstream of engineering and scientific thought with some of its members proceeding to the very cutting edges of their professions. The increased enrollment obviated the trauma of either getting rid of lagging faculty members or of making a formal effort to re-educate them. Their new colleagues took care of that without harm to their sensibilities. (As Assistant to the President I had the privilege of watching this conscious strategy work, and I believe that this is the first time that this information has appeared in print.)

An important factor in Rensselaer's rejoining the mainstream of engineering and scientific thought was the Post-War Planning Committee appointed by Dr. Hotchkiss in 1943. Under President Houston the committee was encouraged to continue its work and, late in 1944, it presented its findings and deliverations. These resulted in policies and goals which are still being pursued with occasional updatings.

Among the committee's recommendations were:

1. A basic eight-course core curriculum for the study of the humanities and social studies.
2. A full-fledged graduate school headed by a dean.
3. Greater emphasis upon research by the faculty and graduate students.
5. Improved student-faculty relations.
6. Increased emphasis upon breadth as well as expertise in scientific, social, cultural, and professional matters.
7. An upgrading of Rensselaer personnel, including students, faculty, administrators, and staff.
The implementation of the post-war planning committee report resulted in the formal establishment of the graduate school in 1952 and in the establishment of three additional degree-granting curricula - Geology, Mathematics, and Mechanics. In 1955 the Hartford Graduate Center was founded in Hartford, Connecticut. It was established to meet a need by industry and professional engineers for continuing graduate education culminating in a Master's Degree. Rensselaer monitored the quality of the graduate instruction and awarded the degrees. The Graduate Center has now become an independent organization with close affiliation with Rensselaer. During the early 1950's greater attention at RPI was given to the role of humanities and social studies in the education of engineers, scientists, architects and managers.

In 1957 toward the close of the Houston administration Rensselaer was reorganized into schools each headed by a dean. These schools were: Engineering, Science, Architecture, Management, Humanities and Social Studies, and Graduate Education. This is the academic organization under which Rensselaer operates today.

In 1947 President Houston brought to the campus as social director Mrs. Walter Phelps Warren (Helen Warren). This was in answer to the obvious need for the improvement of the social temper of the campus and to advise and guide students upon their request regarding the proprieties of social conduct. Mrs. Warren together with the three chaplains who came to the campus during the war began a humanization and a ministry to the psychic and spiritual and philosophical aspects of student life that has continued to grow into an integral part of the Rensselaer educational experience.
Mrs. Warren also served as a friend and advisor to the few women students who were beginning to enroll at Rensselaer. Women at Rensselaer are expected to comprise about one quarter of the total enrollment during the 1980's. Though women were at first grudgingly accepted by the male students, thanks to Helen Warren's wise counsel and her influence upon student leaders who admired and respected her, Rensselaer did not experience the antagonisms that flared between the men and women students on a number of other campuses. In other sections of this book are found sketches of the careers of women who have achieved notable professional and business success.

President Houston retired as resident on March 1, 1958. President George Low commented as follows about "Liver" Houston: "Three decades ago, under his leadership, RPI made the successful transition from a relatively small, administratively simple institution to a complex, modern university. I was a student here during these exciting years and remember well Dr. Houston's direct personal role in the life of the campus. That close involvement continued..."

In many respects President Houston was the right man for the job of heading Rensselaer during the turbulent post-war years and during Rensselaer's subsequent reorganization. As a man of affairs and social charm he was eagerly sought by business and society and he won for Rensselaer an understanding and a friendship amongst community and area leaders in all phases of life. The Houston Field House symbolizes that intermingling of community and campus. It is the scene not only of Rensselaer's
first-division hockey team contests, but also of symphony concerts, exhibitions, political rallies, figure and public skating, commencements—Russell Sage and Rensselaer—and national association meetings that bring to Troy and RPI people of renown from all over the world.

President Houston participated in community organizations and he encouraged other members of Rensselaer to do so likewise. He was polished, friendly, sympathetic and, above all, just and fair. He loved to play tennis, collect antiques, sail, and figure skate. He and Mrs. Houston were excellent and warm hosts and, for many years, their Christmas parties were a highlight of the holiday season for their many friends in the area. He lived life to the hilt and enjoyed almost all of it. As Dr. Low stated, for many years he was the living symbol of Rensselaer. He took the engineer out of the field and shop, cleaned him up and brought him into the drawing room to join as an equal the other learned professions.
Clarence E. "Colonel" "Pinkie" Davies entered Rensselaer in 1910, received his M. E. Degree from it in 1914 and was intimately associated with it until his death in November 1976. He probably knew more Rensselaer alumni over a longer span of time than any other Rensselaer graduate.

The Engineering Institute of Canada, in naming him an honorary member of that organization said of him, "Probably no other American engineer in our generation has done more than Colonel Davies to promote mutual understanding and practical working relationships among the engineering societies of the Western World..."

Upon graduation from Rensselaer, Pink Davies went to work for the Remington Typewriter Company until he enlisted in the Ordnance Department of the U. S. Army during World War I. After the war he rejoined Remington for a short while. In 1920 he began his long association with the American Society of Mechanical Engineers, becoming its associate editor. In 1921 he was promoted to Managing Editor and Assistant Secretary, and in 1934 he was named Secretary of ASME, a post which he held until he retired in 1957.

In World War II he served as a Colonel in the Ordnance Department, receiving the Legion of Merit Award for the efficient expansion of the Department to meet wartime needs. From 1939 to 1941 he was President of the Newcomen Society of England, being the first non-Englishman to hold this office. The Newcomen Society is devoted to preserving and interpreting the history of engineering. Colonel Davies also served on the Council of the American Society for
Engineering Education and on numerous international professional engineering and scientific societies. He was Vice President of the American Society for the Advancement of Science, the first secretary of the Engineers Council for Professional Development. Thus he devoted his professional career to the promotion of greater cooperation and understanding among engineers and scientists and to the raising and maintenance of professional standards and ethics.

Colonel Davies was awarded the honorary degree of Doctor of Engineering by Clarkson Institute of Technology and by Drexel Institute of Technology.

But despite his international honors and high position in the engineering profession, his first love was Rensselaer and the Rensselaer Alumni Association. For ten years he served officially as Secretary of the Rensselaer Alumni Association, but his influence was felt in the association and at Rensselaer throughout his career whether he held an official position or not. He was a trustee of Rensselaer from 1949 to 1970, at which time he was named an Honorary Trustee. Because he had a broad knowledge of what other institutions were doing and of what the engineering profession was seeking, he was often impatient with the pace of Rensselaer's progress, and whenever Rensselaer began to lag he served as a hair shirt and a goad insisting that Rensselaer remain in the forefront of engineering education.

Many alumni will remember Pink Davies for his leading of the Glee Club in its rendition of the Alma Mater, something in which he took special pride. For many years he had been associated with the University Glee Club of New York and had served as its vice president.
In 1970, he was awarded the Rensselaer Alumni Association's highest honor, the Distinguished Service Award. In 1874, Erik and Margaret Jonsson endowed a medal in Colonel Davies' honor. The medal is awarded by the trustees to an alumnus for "outstanding achievement across a wide range of engineering applications."
George R. Town, RPI '26, has played an important part in engineering education, in industry, and in the direction of Associations. His most recent position before his death was as Director of I.S.U. World Food Institute. From 1957 to 1958 he served as Executive Director of the Television Allocation Study Organization. This organization was concerned with Ultra High Frequency Television allocations.

Upon receiving his degree of Electrical Engineer in 1926, he elected to continue his studies at Rensselaer and earned his Doctorate in Electrical Engineering in 1929. After employment by Leeds and Northrup and Arma Engineering, George Town returned to Rensselaer as an instructor in electrical engineering from 1933 to 1936. He then spent 13 years with Stromberg-Carlson Company.

Among the positions he held at Stromberg-Carlson were: engineer-in-charge of the television laboratory, assistant director of research, manager of engineering and research, and assistant secretary of the company. While so engaged he also taught in the extension division of the University of Rochester. He was elected a Fellow of the Institute of Radio Engineers and committee chairman in the engineering division of the Radio Manufacturers Association.

In 1949 Dr. Town joined the staff of Iowa State College as associate director of the Iowa Engineering Experiment Station and as Professor of Electrical Engineering. In 1959 he was named Dean of the Iowa State College of Engineering, serving until his retirement in 1970.

In 1963 he was given the Engineering Achievement Award by the National Association of Broadcasters, and in 1974 he was presented
with the Herbert Hoover Centennial Award for his services as Director of the World Food Institute. In 1962 he was awarded the Dunlap Medal by the Iowa Engineering Society. He is the author of numerous scientific papers and textbooks, several of which are still in classroom use. He was a Trustee of the Wesley Foundation and he was a member of Sigma Xi and Tau Beta Pi.
If you were to visit Israel and travel in the Ambassador Yitzhak Rabin Forest (Rabin was subsequently Prime Minister of Israel) you would journey along the Hassan Scenic Road, named in honor of Mr. and Mrs. Alexander Hassan, RPI '27. For many years the Hassans have been pillars of strength for the support of the State of Israel and its educational institutions. During 1978 and 1979 Alexander Hassan was National President of the American Technion Society. Since 1923 he has served on the Technion's International Board of Governors, and in 1975 the Technion named him an Honorary Fellow.

Alex has also served as a Trustee of Rensselaer and, in 1962, was awarded the Albert Fox Demers Medal for outstanding service to Rensselaer and to its Alumni Association. President of Loisdale Utilities Corporation, an organization engaged in large scale land development, he has somehow found the time and the funds to be of benefit to numerous charitable and educational institutions. Although many of his services and benefactions have been associated with Jewry, he has also been of great service to other community, state, and national organizations.

He is a Past President of the Washington Athletic Club and member of its Board of Governors. He was formerly an officer and a member of the Board of the Young Men's Christian Association. He is a member of the Advisory Council of the School of Engineering and Applied Science of George Washington University. He is an Honorary Professor of Mathematical Science at Rensselaer. Alex and Sylvia were honored by the Jewish Theological Seminary of America with its National Award for Community Service.

Alexander Hassan is Honorary Vice President of the Zionist
Organization of America and the recipient of The Louis D. Brandeis Award in 1973. For many years he has been a member of the Executive Board of the United Jewish Appeal, Jewish Community Center, and Shaare Zedek Hospital.

He was also one of the Founders of the Weizmann Institute of Science, a member of the Board of American Associates of Ben-Gurion University, and a member of the Board of the American Friends of Hebrew University from which he received its Leadership Citation, and he has served as a member of the Board of Volunteers for International Technical Assistance (VITA).

He has been an active member of the Class of 1927, a generous donor and Patroon of RPI, and a member of the RPI Alumni Council. His services to Rensselaer, the education, to the State of Israel, and to his fellow Jews throughout the World, assisted and often egged on by his wife, Sylvia, have been so exceptional that it is hard to understand how he has had the time, the energy, and the funds for all of his humanitarian and educational endeavors; only a portion of which have been mentioned in this brief sketch.
Robert J. Painter '28 CE served as Executive Secretary and Treasurer of the American Society for Testing Materials from 1952 to 1971. He was a member of numerous professional engineering societies and a Fellow of the American Association for the Advancement of Science.

Upon graduation from Rensselaer, he took a position as an instructor in its Civil Engineering Department for two years. Then he went to work for Bethlehem Steel Company before joining the staff of the American Society for Testing Materials, serving first as a staff assistant, then as assistant to the Secretary. He became Assistant Secretary in 1946, and he was advanced to Secretary of the Society in 1952.

Although the demands of his job kept him busy and moving about the country, he did find the time to participate in Rensselaer Alumni affairs, particularly with the local Rensselaer Alumni Chapter in Philadelphia.

The American Society for Testing Materials played a key role in the development of methods of testing and in the standardization of specifications. It had a membership of about 10,000 persons, including 1,500 foreign members. Its recommendations formed the basis for many local and state building and operating codes.
Although Chauncey Starr, RPI '32, had already achieved status as a metallurgist, physicist, and researcher in electronics, it was not until he was asked to head a research team in the Manhattan District project that he discovered that he had talent and ability as an administrator. He is presently Vice Chairman of the Electric Power Research Institute, Palo Alto, California.

Upon receiving his degree of Electrical Engineer from Rensselaer in 1932, he decided to accept a Research Fellowship at his alma mater and continue study toward his doctorate, which was awarded to him in 1935. In 1964 Rensselaer also awarded him the Honorary Degree of Doctor of Engineering.

Chauncey Starr continued his studies as a Research Fellow at Harvard, followed by an appointment as a Research Associate at MIT. From 1942 to 1946 he worked for the Manhattan District at the Radiation Laboratory of the University of California; at the Tennessee Eastman Corporation at Oak Ridge and at the Clinton Laboratories at Oak Ridge.

From 1946 to 1966 he served as President of the Atomics International Division of North American Rockwell and as Vice President of the parent company. Then from 1966 to 1973 he was Dean of the School of Engineering and Applied Science, University of California, Los Angeles. He became President of the Electric Power Research Institute in 1973 and Vice Chairman in 1978. Upon taking this position he said, "I believe that it would be important to involve in RPI's studies not only technical specialists, but also those deeply concerned with environmental and social impacts...the role of technology in social development is a very key one and..."
the electric utility industry play(s) an essential function in the structure and prosperity of our society."

A colleague says of Starr, "...his operating style--to bring in good people and then with minimal 'coaching' let them get things going with maximum freedom." Starr, himself, says, "You build an organization chart around people." Starr's administrative style is very informal. He is goal oriented. He doesn't like structure. He doesn't like rules. He is completely impatient with anyone who cites a rule that gets in the way of an objective. The same colleague says, "He just goes to the heart of the matter. He is the goal-oriented leader par excellence."

When he was asked about the Electric Power Industry's unfinished business Starr commented, "The industry really needs a clearer understanding of its own relation to the total life of our society, and that relation has to be more thoroughly explored."

Starr has more than 35 publications to his credit, and he is or has been a member of at least thirty professional societies and organizations. He is a member and former Vice President of the National Academy of Engineering, a foreign member of the Royal Swedish Academy of Engineering Sciences, a former member of the President's Energy Advisory Committee and a member of the U. S. delegation to the US/USSR Joint Committee on Cooperation of Peaceful Uses of Atomic Energy. He was formerly Chairman of the Board of Governors, Scientific Research Society of America, and he was a member of the President's Task Force on Science Policy, U. S. Government.

His honors include membership in Sigma Xi and Tau Beta Pi
the Atomic Energy Commission's award for meritorious contributions to the Atomic Energy Program, the Pender Award of the University of Pennsylvania, and the rank of "Officier" in the French Legion of Honor for furthering scientific and industrial understanding between France and the United States.

Starr says of himself, "I do my homework. I do not rely on intuition, but rather upon a detached analysis of the facts. That's why I appear to be so sure of myself even though facts are only a part of the decision-making process."
Although Rensselaer Polytechnical Institute was founded "to educate the sons and daughters..." it was not until April 22, 1945 that it awarded two earned degrees to women. These women were Lois Graham, B.M.E. and Mary Ellen Rathbun, B. Met. E. Because of the war-time speed-up, their official class membership is listed as 1946. Lois Graham went on to establish other firsts. She was the first woman to receive a Master's degree in Mechanical Engineering at Illinois Institute of Technology and the first woman to earn a Doctor's degree in Mechanical Engineering from the same institution. There is good reason to believe that she was the first woman in the United States ever to earn a Doctor's degree in Mechanical Engineering. This statement has been made in print several times and it has not been challenged.

After graduating from Rensselaer, Lois Graham worked as a test engineer for the Carrier Corporation from April 1945 to September 1946. She then became a graduate assistant at Illinois Tech, rising through the academic ranks to the position of Professor of Mechanical Engineering in 1975. Recently, 1980, she has received the Ralph R. Teetor Award and the I.I.T. Alumni Professional Achievement Award. She is presently Secretary of the American Power Conference, an event attracting over 3,000 participants throughout the world. She is Director for motivation and support for the Greater Chicago Area Program for increasing minorities in engineering, having important fiscal responsibility for the major part of a $120,000 grant. She is also Director and active faculty participant in I.I.T.'s Minorities in Education Program, which has won an award from the Academy of Educational Development.
Lois Graham is also Director of I.I.T.'s E³ Program Center. E³ stands for Education and Experience in Education. This is a degree-granting department with an innovative multidisciplinary curriculum based on self-paced instruction. In 1967 to 1968 she was a member of the Visiting Committee for the ASEE Humanistic Social Research Project which resulted in the ASEE publication "Liberal Learning for the Engineer."

In 1954 Lois Graham became Secretary of the Society of Women Engineers, and in 1955 to 1956 she served as President of the Society. From 1971 to 1974 she served as Chairman of the Heat Transfer Division of ASME. In 1977 she was elected President of the I.I.T. chapter of the American Association of University Professors, a position she presently holds. She is also President of the IIT Chapter of Sigma Xi.

From 1973 to 1975 Lois Graham was the IIT Representative to the Faculty Advisory Committee to the Illinois Board of Higher Education. She is also presently (1980) a member of the Board of Directors of the Rensselaer Alumni Association. At Illinois Tech she was President of the Faculty Armour Club from 1971 to 1972, Chairman of the Senate Committee on Education and Research (1977-79) and a member of the Curriculum Committee from 1958 to the present. She also served as Chairman of the Faculty Senate in 1967 to 1968.

Lois Graham has published over twenty papers in professional journals and has served as a consultant to two publishing houses. She was a member of the National Research Council's Graduate Evaluation Panel 1978 to 1980. She has also served as a consultant for Hallicrafters, the Armour Research Foundation, and the Institute of
Gas Technology.

While people have been debating ERA and the role of women in the professions, Lois Graham has been demonstrating beyond all question of a doubt, the ability of women to excel in engineering.
Edward Epremian, RPI, M.S. '47, Ph.D. '51, has been Executive Director of the Commission on Sociotechnical Systems since 1976. This Commission operates under the auspices of the National Academy of Sciences, National Research Council. With the growing concern about where technology is leading mankind, the Commission's work becomes increasingly pertinent and important.

While studying for his Master's degree in Metallurgy at RPI, Edward Epremian was employed by the General Electric Company as a Research Associate. Upon receiving his doctorate from RPI he joined the U.S. Office of Naval Research in London, England, as Scientific Liaison Officer, advancing to Deputy Scientific Director in 1953. From 1954 to 1957 he served as Chief, Metallurgy and Materials Branch, Division of Research, for the U.S. Atomic Energy Commission.

From 1957 to 1976 he held a variety of positions with Union Carbide Company from Senior Metallurgist in 1957 to Director of New Ventures in 1973. Between these positions served as General Manager, Advanced Materials Department of the Union Carbide Products Division, and Manager of Special Products of the Union Carbide Metals Division.

Mr. Epremian has served on the Materials Advisory Board of the National Academy of Sciences in numerous capacities which included membership on the Committee for Standing Review of the Department of Defense Materials Program. In 1956 he was U.S. Scientific Secretary, Atoms for Peace Conference in Geneva. He organized and was a participant in the Conference on Nuclear Fuels in Paris 1957.

From 1969 to 1973 he was a member of the Advisory Committee
to the University of Pennsylvania School of Metallurgy and Material Sciences. He has been a member of the Advisory Council of the College of Engineering, University of Maryland since 1978, and he has been a member of the Board of Trustees of Webb Institute of Naval Architecture since 1976.

Mr. Epremian is the author of 14 technical papers on metallurgy and metals and was the organizer and co-editor of *Columbium and Tantalum* published in 1963. He holds two patents on high temperature alloys. He has served as Chairman of various national Committees of ASM, AIME, and AIAA. He is an authority on the Archaeology and History of Materials Technology. He is also a member of Sigma Xi and a Fellow of the American Society for Metals, and he is a member of the American Association for the Advancement of Science. His hobbies include skiing, photography and sailing.
From 1977 to June 1979 Gene G. Mannella was Senior Vice President, Engineering Research, at the Institute of Gas Technology, Chicago. In June 1979 he became Vice President and general manager, Stirling Engine Systems Division of Mechanical Technology, Inc. He had received his Master's degree in Chemical Engineering from RPI in 1955 and his Ph.D. (Chem. Eng.) degree the following year from RPI. He had earned his bachelor's degree at Case Institute of Technology in 1953.

At the Institute of Gas Technology, Dr. Mannella was responsible for the management of the engineering research division, which included major programs in alternative energy systems, energy conservation, solar applications, unconventional natural gas, energy conversion, and energy storage. Previously he had been the head of the U.S. section on automobile transport of the joint U.S.-U.S.S.R. working group on transportation.

From 1964 to 1971 he served as Director of Technology, NASA Electronics Research Center (later DOT transportation Systems Center). He was Dean, School of Engineering and Architecture, the Catholic University of America, from 1971 to 1972, holding appointments as Professor of Chemical Engineering and Professor of Aerospace Sciences.

He then became Associate Administrator for Research and Development, National Highway Traffic Safety Administration, responsible for vehicle and road safety research and for the international Experimental Safety Vehicle Program under the NATO Committee on Challenges to Modern Society. From March 1976 to October 1977 he served as Acting Assistant Administrator for Conservation, Energy Research and Development Administration responsible for the national
Energy conservation research and development programs.

Presently at Mechanical Technology he is directing the development of a Stirling Engine for automotive applications under a $95 million contract awarded by the U. S. Department of Energy and by NASA.

Dr. Mannella served as chairman of the fourth International Conference on Experimental Safety Vehicles in Japan in 1973 and the fifth International Conference of the same group in London in 1975. He also served as a member of the Task Force on Voluntary Automobile Fuel Economy Goals, DOT, 1974 to 1975.

Gene Mannella has delivered invited lectures at Kenyon College, Clarkson Institute of Technology, Boston College, and Purdue University. He is the author or co-author of 29 technical papers, and he has received five citations and awards, including the Apollo Achievement Award, 1969, the DOT Award and Medal for Meritorious Achievement in 1971, and the ERDA Award for Outstanding Leadership in 1976. He is a life member of Tau Beta Pi and a senior member of Sigma Xi.
Edward C. Harwood, RPI '22 C.E. is a man who has had three successful careers. He was one of the West Point graduates on an accelerated program to whom I refer in subsequent chapter of this book. He is undoubtedly best known as Director Emeritus of the American Institute for Economic Research, his third career. After earning his C.E. degree from Rensselaer in 1922, he remained in the Army until 1937, at which time he retired.

He advanced through the military grades to the rank of Colonel in 1933. From 1930 to 1934, he served as U. S. District Engineer in Boston in charge of improvements to the Cape Cod Canal. He also was in charge of flood control surveys in New England and of the construction of CCC camps. In 1940, as war threatened, he returned to the Army on active duty. From 1942 to 1943, he served as an engineering executive in the ETO. Then he was recalled to Washington to serve as Chief of the Mobilization Division of the War Department. From 1942 to 1943 he served as Chief of Staff of the Army Service Command in the Southwestern Pacific. He retired from active duty in 1946.

He served as a Director and Trustee of the American Institute for Economic Research from 1934 to 1968. He is Treasurer of the Behavioral Research Council, President and Chairman of the Board of Progress Foundation in Switzerland, a Trustee of Henry George School of Social Science, and a member of the Economists National Council on Monetary Policy. He is the author of eleven books on economics and monetary policy and a frequent contributor.
to journals. He was one of the first economists to point out the devastating effects of inflation, and he has remained a firm believer in gold as a monetary standard.

Liberal economists have labeled Edward Harwood as an ultra-conservative but, despite this reputation and label, he and the institution which he headed for so many years have diligently tried to maintain an objective and scientific attitude toward money values. In this respect the by-laws of the American Institute for Economic Research are of great interest, and I here quote excerpts at some length in order to show the extent to which Ed Harwood has gone to try and come up with unbiased research.

Here are the excerpts: "To avoid bias from attempting to satisfy wealthy donors or to protect substantial invested funds, the Institute shall seek to derive its support from small contributions from the general public....The Institute shall be absolutely non-political...No attempt shall be made to propagandize...persons engaged in research shall avoid all conflicts of interest that might inhibit scientific work or bias them in any way....they must differentiate clearly in all of their writings and public statements so that those to whom they communicate will understand whether they are speaking or writing in their roles as scientists within their fields of competence or whether they as private citizens are simply urging a course of action that they personally prefer."

Ed Harwood makes a clear distinction between trading and investment. He says that his and other studies show that there is no reliable way to forecast stock market movements and that "traders" sooner or later come a cropper; whereas, investors who take into
account longer cyclical movements are much more likely to be successful.
William S. Corey '33 E.E. is presently Chairman Emeritus of Provident Indemnity Life Insurance Company, a company which he joined after his graduation from Rensselaer. An RPI Electrical Engineering graduate, he furthered his education by taking a Master's Degree in Mathematics from the University of Michigan and doing further graduate study in insurance and economics at the University of Pennsylvania.

At Provident Bill Corey worked at a variety of jobs from agent to actuary before becoming an administrator. He became Executive Vice President of the Company in 1951, President in 1961, and Chairman of the Board in 1970. He reached Emeritus status in 1977. He is a Past President of the Pennsylvania Life Insurers Conference and a past Chairman of the Insurance Federation of Pennsylvania, Incorporated, a position of considerable importance and prestige.

He is a former Chairman of the Patroons of Rensselaer, a fund-raising organization, and a former Director of the Rensselaer Alumni Association. He is currently a member of the Rensselaer Alumni Council.

Since his retirement he has been associated with the International Executives Service Corps and has served as a consultant to life insurance companies in Sierra Leone, Thailand, and Hong Kong. He is a regional director of the Continental Bank and Trust Company, and he has been active in many local and county organizations. He is a past President of the Norristown YMCA, the Norristown Kiwanis Club and the Norristown Chamber of Commerce. He continues as a Director of the Montgomery Hospital and the American Lung Association.
At Rensselaer he was member of the soccer team. One of his hobbies is yachting, and he is a member of the Annapolis Yacht Club and the United States Coast Guard Auxiliary.

William Corey's career is an example of the application of expertise to a variety of human and financial activities. He has served his community, his colleagues in the insurance business both in the United States and throughout the world, and Rensselaer Polytechnic Institute.
Carl J. Thomsen '38, Ind. E., is Chairman of the Rensselaer Board of Trustees and General Director of Texas Instruments, Incorporated. He is currently Chairman of the Board of Directors for Pacific American Income Shares and Chairman of the Board of Directors for the Goals for Dallas. From 1965 to 1970 he served as Chairman of the Federal Reserve Board of Dallas, Texas.

Despite his present and past prominent positions in industry, higher education, and the Dallas Community, Tommy has managed exceedingly well to keep out of the limelight, so much so that, although I have known him since his undergraduate days at RPI, I know less about him than I do about many other Rensselaer graduates.

After graduation in 1938 he became associated with Westinghouse Electric Corporation. He did graduate study at Johns Hopkins University, and joined the U. S. Naval Reserve as a Lieutenant, J.G. in the Bureau of Aeronautics, serving in World War II. In 1946 he joined Texas Instruments, Incorporated, and he has been with that corporation ever since.

In 1951 he was made Vice President of Texas Instruments, and the following year he was given the responsibility for Control and Finance. He was also elected a Director of the Corporation. In 1965 he was named Senior Vice President, in which post he served until 1974 when he assumed the title of Officer of the Board and later General Director.

He was elected a director of the Controller's Institute of America in 1961, and he was member of the Finance Division Planning
Council of the American Management Association. He was also a member of the Procurement Advisory Committee of the National Security Association. He is an ardent sailor, trout fisherman, and history buff, having been a former member of the Dallas Sailing Club. He was also on the Overseers Group of the Old Sturbridge Museum in Sturbridge, Massachusetts. During the construction of the Dallas-Fort Worth Airport, Thomsen was a Board member and Chairman of the Finance Committee of the Airport Board.

Carl Thomsen was elected a Trustee of Rensselaer in 1965, and he served as Treasurer of the Board. He became Chairman of the Board in 1973. He has been active in Rensselaer Alumni Association and in Rensselaer fund raising activities, being a member of the Amos Eaton Society of donors. Under his Chairmanship, Rensselaer has not only made significant progress, but it has also become a happy place to study and work. Much of the splendid high morale on the RPI campus is due to the combined efforts of the Board of Trustees under "Tommy's" leadership and President George Low. It's a great team.

Like so many other successful Rensselaer graduates, Tommy was elected a member of the Tau Beta Pi. In May 1980 the Rensselaer Alumni Association awarded Tommy its Distinguished Service Award.
Joseph A. Rice '48 is National Campaign Chairman of the Rensselaer Fund. He should know where the money is because he is President and a member of the Board of Irving Trust Company of New York City. He is also President of Irving Bank Corporation, a multi-bank holding company which owns the Irving Trust Company and fourteen other New York State banks. He has been a Trustee of Rensselaer since 1974.

He holds a bachelor's degree in Aeronautical Engineering from RPI and a master's degree in industrial engineering and government from New York University. Prior to joining Irving Trust Company in 1967 as Vice President for corporate planning, he worked for Grumman Aircraft Engineering Corporation, IBM, and International Telephone and Telegraph Corporation.

At IBM he held various management responsibilities in the manufacturing area. At ITT he was Deputy Group Executive, North American Telecommunications Group and President ITT Telecommunications Division. In 1969 he was elected Executive Vice President of Irving Trust, in 1972 Senior Executive Vice President and a Director of the Bank. In 1973 he was named Vice Chairman, and in 1974 President. He was elected a Director of Irving Bank Corporation in 1973 and was named President of the Corporation in 1975.

He is Chairman of the Board of Directors of the Greater New York Fund/United Way and a Director of the Association of Bank Holding Companies.

While at Rensselaer, like so many successful graduates, he was a member of Tau Beti Pi and Sigma Xi.
In 1952 William G. Lillis '52 B.C.E. captained Rensselaer's undefeated lacrosse team, which was also named national co-champion. He has been on winning teams ever since. After graduating from RPI, he went on active duty with the Navy as an Ensign and as a base maintenance officer.

From 1954 to 1956 he worked for the Pennsylvania Railroad as an assistant track supervisor. Then for the next ten years, 1956 to 1966, he was Plant Maintenance Engineer and Assistant Plant Supervisor for Bush Terminal Associates in Brooklyn, N. Y. Bush Terminal Associates is a complex of 16 buildings comprising over 6 million square feet and occupied by 110 different companies. There he was responsible for the maintenance and alteration of all buildings including direct supervision of the maintenance staff. He participated in lease negotiations and handled lease renewals.

In 1966 he joined Metropolitan Insurance Company where he engaged in Real Estate Financing. He became responsible for the management of Company-owned buildings in New York City and, in addition, made income and expense analyses of the company's major mortgaged properties all over the United States. By 1970 he was in full charge of all of the company's mortgage business in New York City.

In 1970 Bill Lillis became Senior Vice President of Helmsley-Spear, Inc. Here he was directly responsible for the acquisition of new properties for the corporation and for the construction of new buildings. This included the construction of the 57-story One Penn Plaza, the 25-story 10 Hanover Square, the
35-story 22 Cortlandt Street building and the Park Lane Hotel in New York City. He also had management responsibilities for large apartment complexes such as the 12,000 unit Parkchester Apartments. When he became Executive Vice President of the company he had general responsibility for all Harry B. Helmsly owned properties.

In April 1976 William G. Lillis became Executive Vice president of the Empire Savings Bank and in January 1979 he was named president. In 1979 he also was named Distinguished Fellow of Mortgage Banking by the National Association of Mortgage Bankers. So, if you want to buy a house, you know where to go for a loan.
The career of George P. DiNardo, RPI '59, exemplifies the opportunities that technically educated people have in applying technology to banking. He earned his Bachelor's and Master's degrees in Management Engineering at Rensselaer.

After a tour of duty as Engineering Officer on a U. S. Navy destroyer, he did further graduate work in Econometrics at New York University. Then he joined Bankers Trust Company of New York City where he rose to the position of Vice President and Manager of Data Processing.

He joined Mellon Bank of Pittsburgh in 1969, becoming Vice President of Information Processing. He is responsible for all electronic data processing services of the bank including operations, systems programming, and applications programming for the bank's computers in batch, time-sharing, and teleprocessing modes. The computer installation is one of the largest in banking and, as someone once stated, "With these powerful machines there are no longer any minor errors." George's machines have had a remarkably error-free history.

George was recently (1979) promoted to Senior Vice President and assumed the additional responsibility for voice and data communications for the Mellon Corporation. George is proud of the fact that Mellon has achieved an excellent reputation in terms of bank data processing and is considered to be the leader in the banking industry.

DiNardo is also responsible for providing data processing services for 300 other banks throughout an eleven state area (as far away as Florida). George states that, "This is a most exciting
phase of our business; we are providing a service for a fee, are
adding customers as fast as we can convert them, and are producing
a good profit." He considers this an important extension to banking
as it is a source of fee income not subject to interest fluctuations.
If you own a small or medium-sized company that is being forced to sail close to the wind, you might want to consider hiring the services of Kirk Knight and Company, Management Consultants to small and medium-sized companies. Its president is Glenn M. Mueller '64, and he and his company have already served over 200 companies, helping them to enhance their growth. Glenn was also the 1976 season champion for the Cal 3-30 Class yachts of the Yacht Racing Association of San Francisco Bay.

Kirk Knight & Company is a wholly owned subsidiary of California Northwest Fund, Inc. of which Mueller was a founder. He is presently a Director and Senior Vice President of CNF. He is also a founder, director and member of the executive committee of Menlo Financial Corporation, a combined asset management and professional service organization.

Glenn Mueller's interests are in new and emerging high technology growth companies. Prior to his present positions he has worked for Singer Corporation, Bechtel Corporation, and Pacific Gas & Electric Company. In 1966 to 1967 he served as Manufacturing Engineer for Hewlett-Packard Company where among other jobs he was responsible for the research, equipment specifications, personnel organization and layout of multilayer printed circuit board fabricating facility. Following this position he was Manager of Planning for Materials Analysis Company where he was responsible for the preparation of its five-year corporate plan. During this time he also worked on consulting assignments for small and medium sized companies with Kirk L. Knight, analyzing investment opportunities and assisting managers in developing corporate growth
plans and investment strategies.

Glenn holds a Bachelor of Electrical Engineering degree from Rensselaer and a Master of Business Administration degree from Stanford University. He is a member of the Rensselaer Council. In 1964 he was President of the Interfraternity Council and of Phalanx. He is Founder and Past President of the San Francisco Bay Area Chapter, Rensselaer Alumni Association, and he is a member of the Board of Trustees of Stanford Sailing Association. He is a Trustee of Family Service Association of the Mid-Peninsular, a Past Director and Past Vice President of the Western Association of Venture Capitalists, a member of the National SBIC Council since 1977, and a member of the Stanford University Medical Center Friends Steering Committee. He is also a member of the St. Francis Yacht Club of San Francisco and of the Sausalito Yacht Club. For tasty dishes consult his wife, Nancy, who manufactures fresh frozen quiche and hors d'oeuvres.
G. Robert Tod, '67, BME, now heads a group comprised of eight companies involved in the manufacture and distribution of leisure time products. Mr. Tod is president and co-founder of CML Group, Inc., whose companies include Boston Whaler, Carroll Reed Ski Shops, Ericson Yachts, Gokeys, Sierra Designs, Sturbridge Yankee Workshop, Mason & Sullivan, and Hoyt Archery.

From 1970 to 1979, the company increased sales from $10 million to $74 million. Mr. Tod attributes much of the success of the company to a policy of decentralized management. CML's chairman and co-founder, Charles M. Leighton (HBS, '60) says, "We've developed some really independent management teams. Sometimes they're so independent it's unreal."


After graduating from RPI, he spent five years in the Air Force and industry before entering the Harvard Business School. During this time he served with the Air Force Systems Command as a project officer at AF Space Systems Division. He also worked for the Hooker Chemical Company. Mr. Tod is presently a member of the RPI Alumni Council and a trustee of Fenn School (Concord). His directorships include the Concord Cooperative Bank and Emerson Hospital (Concord).

CML Group began in 1969 with a team management approach.
Their goals were to combine innovative product development with the management depth necessary to achieve market expansion and profitable growth in the leisure field. One of the secrets of the success of this group of companies is that its management people are users of its products and thus can monitor quality while at the same time enjoy their hobbies and their leisure. The president of Sierra Designs, for instance, traveled in Europe using Sierra's camping products and observing how European campers used their equipment and what they demanded of it. So Bob Tod and his associates have fun while they're making money.
Martin Siegel '69 is Vice President of the Wall Street brokerage firm of Kidder Peabody and Company. He specializes in the defensive aspects of struggles for corporate control. He explains, "In a corporate takeover situation you realize that your work is making an important impact on people. It involves companies which have been built up by their founders, the careers of management, employees' jobs, and the personal lives of countless people ..."

Siegel's present job seems like a far cry from Chemical Engineering, which he studied at RPI. But he explains it really isn't. "...an engineering education teaches one about problem solving, and the process is little different whether it's in an engineering field or solving problems of corporate acquisitions. It's the same thought processes," he claims.

He also credits his informal education at RPI, where he was prominent in student government and student politics--negotiating with students, looking for compromises, making quick decisions, working to move people with different motivations toward common goals. "They were fast feedback situations, much like my experience at Kidder Peabody," he explains.

While at Rensselaer Siegel worked at Eastman Kodak in the cooperative education program. There he realized that his bent was more with working with people than working with Chemical Engineering. Upon graduation he entered Harvard Business School and received his M.B.A. degree in 1971.

During the past two years Siegel has been involved in over two dozen takeover battles with such success that Business
Week magazine credits him with building Kidder Peabody into a "major contender for corporate takeover transactions" claiming he has won new respect for the defensive aspects of such attempts.
A rotten cantaloupe in a Peoria market provided the clue to the production of higher yielding molds used to manufacture penicillin. It resulted in yields 150 times greater and helped to reduce the price of 100,000 units of penicillin from about $20 to 60 cents. The penicillin project was undertaken during World War II. It was given top priority, and all penicillin produced was earmarked for the Armed Forces for the treatment of casualties. This is an example of but one of the results obtained by the Bureau of Agriculture and Industrial Chemistry of the U.S. Department of Agriculture under the direction of Dr. Guido E. Hilbert, '24 Ch.E.

As chief of the Bureau he directed a program of research that included over 350 different projects and employed about 1600 people. The results of all this research gave the U.S. better fabrics, new plastics, improved synthetic fibers, many medicines derived from farm products, improved food processing, greater utilization of farm residues and wastes, and cheaper chemicals. In addition to increasing penicillin production, the Bureau's research found a way to restore weakened capillary blood vessels by using rutin obtained from green buckwheat plants. Rutin also gives protection against the harmful effects of X-rays, and it may be effective in treating persons exposed to the harmful effects of radiation.

After graduation from Rensselaer, Dr. Hilbert earned his master's degree from Lafayette and his doctorate from Yale. He joined the Department of Agriculture in 1930. Much of his
work has dealt with the synthesis of organic compounds from plant materials. His early research concerned starch and dextrose.

In 1953 he received the Rockefeller Public Service Award for his work in carbohydrate chemistry and for his more than 70 research publications dealing with the chemistry of farm products. In 1957 President Eisenhower appointed him to the Commission on Increased Industrial Use of Agriculture.

For many years Dr. Hilbert was the Department of Agriculture's liaison representative to the Food and Nutrition Board of the National Research Council. In 1951 at the meeting of the International Union of Pure and Applied Chemistry in Zurich, Switzerland, he was a member of the official U. S. delegation.

Today as we become more conscious of the world's limited petroleum supplies, it is interesting to note that in 1949 under a mandate from the U. S. Congress, Dr. Hilbert's Bureau undertook work to develop cheaper methods for converting farm crops and food residues to alcohol as a motor fuel!

Dr. Hilbert recalls that the most colorful and memorable teacher he ever had was William Pitt Mason, Chairman of the Department of Chemistry and Chemical Engineering at RPI. Dr. Hilbert says he is also indebted to Dr. John Cloke for his encouragement to him to undertake graduate studies and to continue in the field of research. He also reports that one of the most useful courses he took at Rensselaer was Dr. R. P. Baker's course in report writing. He said, "It may be debatable whether poor writing always indicates poor thinking, but certainly good writing does
require clear, logical thinking and a well-developed sense of proportion."

In retirement Dr. Hilbert is consulting about the dangers of pesticide residues in food as well as the possible dangers of food additives.
Referring to the organization directed by Edmond C. Buckley '27 EE., Astronaut L. Gordon Cooper stated, "It is certainly comforting to know, when you are out there, that the world's finest communications network and the finest electronic facilities that man can devise are functioning with a fantastic computer complex that will allow the on-board systems specialists to break out their diagrams and tell you immediately what your situation is in the event of trouble; and this is what happened on several occasions. Without this marvelous organization, it might have been a little more difficult to get back home...."

Buckley was NASA's man in charge of the planning, development, and operation of a world-wide series of tracking stations and high speed data links that located and followed the progress of both manned and unmanned space vehicles within the planetary system. A friend of his jokingly remarked, "Ed could tell you when a gnat blinked on Saturn." His was the real star-track.

Edmond Buckley joined the National Advisory Committee for Aeronautics, the predecessor to NASA, at its Langley Field Research Center in 1930. In 1943 he was named Chief of the Instrument Research Division. He was responsible for the development and construction of electrical, mechanical, optical, and electronic instruments used in wind tunnels, specialized laboratories, and in-flight vehicles. It was he who was largely responsible for the development of the NASA Wallops Island, Virginia, rocket test area and for the flight and ground instrumentation used at the NASA Flight Research Center, Edwards, California.
In 1959 Buckley was appointed Assistant Director for Space Flight Operations at NASA Headquarters. He directed the networks for tracking, communications, and control for Projects Mercury, Gemini, and Apollo. In doing so he saw to it that full use was made of the many existing and planned U.S. military and foreign ground facilities, thus providing NASA with its needed facilities expeditiously and with minimum cost. Before retiring from NASA, Buckley served as Associate Administrator For Tracking and Data Acquisition.

He was Vice Chairman of the Space Flight Ground Environment Panel of the Aeronautics and Astronautics Coordinating Board, Chairman of the U.S. Section of the Mexico-United States Commission for Space Observations, and a member of the U.S. Working Group of the Committee for Space Research. This organization is concerned with international space research activities.

Once when he was asked what he and his organization were up to, Edmond Buckley replied, "We are creating and building scientific instruments that literally extend man's senses into outer space."
In appointing Berwyn F. Mattison RPI '30 BS(Biology) Secretary of Health for the State of Pennsylvania, Governor George M. Leader said of him, "He is one of the nation's foremost authorities on public health." Mattison holds four other degrees - M.A. from the University of California, M.D. and C.M. from McGill University and M.P.H. from Johns Hopkins University.

Yet despite his education at three other prestigious universities, Mattison declares that it was his education under Dr. Archie Bray at Rensselaer that had the greatest influence. Mattison wrote to Dr. Bray "You have given me a standard of intellectual honesty which will always be with me...something of you lives in my every thought and action." (Dr. Bray died November 19, 1942.)

Dr. Mattison before becoming Secretary of Health for Pennsylvania had served in various public health capacities with increasing responsibilities in New York State for over a decade. He headed Public Health in Pennsylvania for three years. Then he served as Executive Director, American Public Health Association, the world's largest organization of public health workers, a post which he held for 13 years. Upon his retirement he returned to his home in Glens Falls, N. Y. For the past ten years he has devoted much of his time to consultation and public health planning.

In addition to his administrative duties in public health services, Dr. Mattison also served in other posts. For instance he was managing editor of the American Journal for Public Health from 1958 to 1970. He served as a lecturer at eight different
universities, and as a Voice of America lecturer, and as the Herman E. Hilleboe Lecturer. He is a Fellow of the American Public Health Association, a Fellow of the American College of Preventive Medicine, and a Fellow of the American Association for the Advancement of Science. He is also an Honorary Fellow of the Royal Society of Health. He received the Hermann Biggs Memorial Award, and he was elected to membership in Sigma Xi and Delta Omega, Public Health Honorary Society.

In 1967 Dr. Mattison was a member of the U.S. Delegation to the World Health Assembly. He was President of the American Association for World Health 1970 to 1971. He was asked to serve on several advisory commissions to the President of the United States dealing with problems of health including the commission on Aging and the Commission of Youth Fitness, as well as the national commission on Community Health Services. Surely the inspiration which Berwyn Mattison received from Professor Bray has enabled him to work for the betterment of literally millions of lives. His career dramatically illustrates the tremendous leverage that inspiring teachers have in benefiting all our lives.
Meredith H. Thompson '32 B.C.E., M.C.E., D.Eng. is a consultant on matters pertaining to Sanitary and Environmental Engineering. As an undergraduate at Rensselaer, he was active in athletics and student politics, and he served as Grand Marshal during his senior year. He was in fact so active in student activities that many of his friends were surprised when he continued graduate study and earned his doctorate in Sanitary Engineering in 1935.

Much of the development of his interest in professional engineering can be attributed to the influence of Professor Edward J. Kilcawley, '28 C.E. M.C.E. Professor Kilcawley was a pioneer in the development of Environmental Engineering with special interest in the purification and maintenance of water supply systems. He was one of the first persons to advocate the clean-up of the Hudson River. Meredith Thompson caught some of his fervor and is still carrying on in endeavors to assure people of pure water supplies and a more healthful environment.

Since his retirement as Assistant Commissioner of General Engineering and Radiological Health in the New York State Department of Health, Meredith Thompson has served as a consultant in Public Health Engineering. He also serves as Executive Secretary of the Conference of State Sanitary Engineers and as Chairman of the Water Resources Committee of the American Public Health Association. Since 1979 he is President of the New York State Rural Water Association and is a Board Member of the National Rural Water Association of Duncan, Okla. He is a member of the Advisory Council to the Environmental Sciences Section of the New York
Academy of Sciences. In 1960 he was Chairman of the Great Lakes-
Upper Mississippi River Board of State Sanitary Engineers.

Meredith Thompson has served as a lecturer or Visiting
Professor at numerous colleges and universities, including RPI,
Russell Sage, the University of Minnesota School of Public Health,
Albany Medical College, Pennsylvania State College, Cornell
University and University of Rochester Medical College. He is
the author of 44 professional articles.

The U. S. Surgeon General appointed Thompson a member
of the Public Health Service's Advisory Committee on Environmental
Health in 1963. Thompson was reappointed for a second term in
1964. In 1961 he was invited by the World Health Organization to
represent the United States at the European Symposium on Planning
and Administration of National Environmental Sanitation Programmes.
He is, furthermore, a member of the Task Force on Environmental
Health of the National Commission on Community Health Services.

In 1964 he was named Sanitarian of the Year by the National
Association of Sanitarians.

Meredith Thompson has conducted a number of studies and
training programs for the U. S. Environmental Protection Agency,
and is Chairman of the Consulting Engineering Firm Selection Board
of the New York State Environmental Facilities Corporation. He
has also been active in community and public service volunteer
organizations. He still plays a good game of tennis and when at
RPI, he was a member of the RPI Varsity Tennis team which I coached
at that time. Other sports activities include golf and curling.

Recently Meredith Thompson as a member of a three member
team was a consultant to the Health Department of Puerto Rico to review, study and recommend an organization to implement the responsibility for carrying out the intent of free Federal Safe Drinking Water Act.
When Dean F. Peterson, RPI D.C.E. '39 was chief of the agricultural review team appointed by President Johnson to review and recommend on agricultural development in Afghanistan in 1967, his services had been requested by His Excellency Mir Akbar Raza, RPI '53, Minister of Agriculture and brother of the then Queen of Afghanistan. (Incidentally although his first name is Dean, Peterson was Dean of Engineering at Utah State University from 1957 - 1973. He then became Vice President for Research, 1973 - 1976.) He served as water resource adviser to President Johnson's science adviser, 1965 - 1966. He is presently Director, Office of Agriculture, Development Support Bureau, A.I.D. He is a world authority on water resources.

Dean Peterson has served on numerous National Academy of Science Committees and Panels. From 1966 to 1975 he was a member of the National Committee for the International Hydrological Decade, serving as Chairman of the Committee from 1966 to 1970. From 1972 to 1974 he was Chairman of the Committee on organization for international water activities, and in 1975 he was a member of the US/USSR Steering Committee on Arid Lands, and in the same year he became a group leader in a scholarly interchange with China in a World Food and Nutrition Study.

In 1968 he was U.S. Delegate to the Council of Europe Water Charter. In 1970 he delivered the Plenary Address at the Second World Conference of Engineers and Architects in Israel, and in 1975 he served as Joint Chairman of the Convocation on Arid Lands sponsored by Hebrew University.

Dean Peterson was made a fellow of the American
Geophysical Union in 1948. The American Society of Civil Engineers gave him the Royce Tipton Award in Irrigation in 1968. In 1974 he was elected to the National Academy of Engineering. The Utah Academy of Sciences, Arts, and Letters presented him with its Distinguished Service Award the same year. In 1976 he was elected an honorary member of American Society of Civil Engineers (the 268th person so honored in its 125-year history). The following year he was elected a Fellow of the American Academy of Arts and Sciences, and in 1978 Utah State University conferred upon him the honorary degree of Doctor of Science. The State of Texas made him an honorary citizen in 1971.

As Special Assistant to the Undersecretary of State for Political Affairs, he served as Director, Office of Water for Peace, U. S. Department of State. From 1972 to 1974 he was National Vice President of the American Society of Civil Engineers. He is also a member of Sigma Xi honorary society.

In applying his knowledge to the cause of world peace and to the alleviation of drought and hunger in arid lands, Dean Peterson continues to provide a high level of service to humanity. His career illustrates the desirability and the need for an understanding of world affairs and of a humane and compassionate application of scientific and engineering knowledge. It also suggests that perhaps the best way to bring about international understanding and peace is through joint efforts to correct conditions that cause starvation and suffering.
Frank J. Devine served as a career diplomat with the U. S. State Department. He graduated from RPI in 1943 with a degree in Business Administration. He served from 1977 to 1980 as Ambassador to El Salvador.

From 1943 to 1946 Mr. Devine served in the U. S. Army, and upon discharge was employed by the Panama Air Depot in Curundu Heights, Canal Zone. In December he left that post to enter the U. S. Foreign Service. From 1948 to 1977 he saw duty in the following countries: Colombia, Uruguay, Chile, Portugal, Dominican Republic, Venezuela, and El Salvador.

From 1953 to 1954 he was at the University of Wisconsin, and from 1957 to 1962, 1973 to 1977, he served in Washington, D. C. He is a graduate of the U. S. National War College, Class of 1962. While serving in Venezuela he was Minister-Counselor of the American Embassy in Caracas. From there he returned to the United States to become Director of the Office of South American North Coast Affairs where he was concerned with United States relations with Colombia and Venezuela.

In 1976 he became Director of Andean Affairs dealing with Bolivia, Chile, Colombia, Ecuador, Peru, and Venezuela. In 1977 from April to October he served as Acting Deputy Assistant Secretary of State for Inter-American Affairs and, in October 1977, he was appointed United States Ambassador to El Salvador. He thus became the highest ranking Rensselaer graduate serving in the U. S. State Department. Mr. Devine's period of over two years in El Salvador coincided with a time of great violence and rampant terrorism. Both the American Embassy Chancery and the American Embassy Residence
were subjected to armed attack, and Mr. Devine was written up in a major United States newspaper as "the most heavily guarded American Ambassador". He and his wife left El Salvador on February 15, and he retired from the United States Foreign Service on February 29, 1980.
Charles W. Mathews '43 is a consultant on space matters to government and industry. His recent activities of this nature include services to the Senate Committee on Commerce, Science and Transportation, the House Committee on Science and Technology, The Boeing Aerospace Company, the Planning Research Corporation, NOAA and NASA. Mathews is a Director of the American Astronautical Society and a Trustee of the Environmental Research Institute of Michigan.

Mathews retired from NASA in February 1976 after 33 years of government service with that organization and its parent organization, NACA. Prior to his retirement he was Associate Administrator for Applications in NASA Headquarters, Washington, D. C. In this position he was overall manager of NASA's program to apply space and space-derived capabilities for the benefit of mankind. This included manned and unmanned spacecraft, aircraft and application of other space technology to earth problems.

From May 1968 until December 1971, Mathews was Deputy Associate Administrator (General Manager) for Manned Space Flight at Headquarters and served in this capacity during the Apollo lunar landings. Prior to that he had been director of the Apollo Applications Program (Skylab), Headquarters, since January 1967.

In 1943 he received a Bachelor of Science degree in aeronautical engineering from Rensselaer Polytechnic Institute, Troy, New York.

Mathews joined the science staff at NACA Langley Research Center in 1943. During his early years at Langley, he was engaged in airplane flight research and was project engineer in the
free-fall test program to determine airplane configurations suitable for use at supersonic speeds.

Later, Mathews shifted his concentration to flight research in the areas of automatic control of airplanes.

Mathews became involved with manned spacecraft studies prior to the time of the first Sputnik flights; he conducted early studies on reentry of orbital manned spacecraft, and developed a configuration for high drag reentry which maintained good low-speed flying qualities. Prior to the formation of NASA, he served as chairman for the group which developed detailed specifications for the Mercury spacecraft.

He transferred to the Manned Spacecraft Center (then the Space Task Group) when Project Mercury became an official national program in 1958. In early work on this program, he served as Chief of the Operations Division and directed the team which established the operating concepts for this new type of mission. Other activities involved in this work included the concept and requirements for the world-wide Mercury tracking network and Mercury Control Center at Cape Kennedy (then Cape Canaveral).

Mathews served as Deputy Assistant Director for Engineering and Development at the Manned Spacecraft Center, and as Chief of the Spacecraft Technology Division. His division conducted studies of the methods for accomplishing manned lunar landings. This work supplied the technical background for the NASA decision to utilize the lunar orbit rendezvous method.

Mathews assumed duties as Gemini Program Manager at the Manned Spacecraft Center on March 19, 1963. Ten successful manned
flights were completed in 1965 and 1966. These flights accomplished the first rendezvous of two spacecraft, as well as extensive long duration missions and extra-vehicular activities. Following completion of the Gemini Program, Mathews was named Director of the Skylab Program (then the Apollo Application Program).

Mathews was awarded the NASA Distinguished Service Medal by President Lyndon B. Johnson on November 23, 1966, for his contributions to the U. S. manned space flight program, a second time in 1969 for his contributions to the first manned lunar landing, and again in 1976 for his contribution to applying space developments to practical uses here on earth. He is also a recipient of the NASA Group Achievement Award--Gemini Program Team (1966) and the NASA Outstanding Leadership Medal (1965). He is the recipient of numerous awards for various technical societies including the Astronautics Engineer of the Year award in 1966. He is the author or co-author of numerous technical documents published by NASA and various professional societies. Mathews is a Fellow of the American Astronautical Society and Fellow of the American Institute of Aeronautics and Astronautics.
How would you like to have a major operation for $2.80? That's what Dr. Kirk R. Stetson, '45 B.M.E. and University of Rochester M.D. charged his patients at the mission hospital in Mt. Silinda, Southern Rhodesia. The patients paid 21 cents a day hospitalization, but if they brought their own food they only paid 14 cents a day. The hospital is a mission operated by the Congregational Church. It is the only hospital within a radius of 25 miles, and the nearest city (10,000 population) is 140 miles away.

Mt. Selinda Mission is located on a mountain 3500 feet high, and its climatic problem is not one of heat but of cold. The temperature rarely gets over 80 degrees there but it drops to as low as 40 in the winter. The name "Silinda" is a corruption of the African word "Chirinda" which means place of refuge.

When Dr. Stetson was discharged from the Navy in 1946, he took a position at Robert College, Istanbul, Turkey, teaching mathematics and physics. Here he had a chance to observe mission work without being involved in it. But he saw enough to make him want to be a medical missionary. He returned to America and enrolled at the University of Rochester, earning his M.D. degree in 1953. Then he obtained three years of experience in various medical and surgical specialties at the Rochester General Hospital before taking up his work in Mt. Silinda. He says, "I am everlastingly thankful that my undergraduate work was in engineering because of the stream of practical problems in the treatment of my patients and in the operation of the hospital." One of his colleagues quipped, "No one should come to the mission field
without an engineering degree."

The hospital, which averages between 2500 and 3000 admissions a year, contains 70 beds, an operating room, and a small X-Ray machine. Dr. Stetson is the only physician. Assisting him are three registered nurses and 29 practical nursing students. The hospital depends upon the patient's family to help with ordinary care, usually cooking his food. At night one member of the family sleeps under the bed. Dr. Stetson sees between 75 and 100 patients a day. (Note: I am using the present tense but I have no information about Mt. Silinda since Rhodesian independence.)

In the Rensselaer Alumni News of January 1959, Dr. Stetson commented on the Chindau language, the language of the natives in that part of Rhodesia. He said that in Chindau all nouns are divided into nine classes, and all adjectives are altered, depending upon what class of noun they are referring to. He tells us that when we, for instance, say "three, big white things" in English, there's no other way to say it. But in Chindau there are nine ways of saying "big," nine ways of saying "white," and nine ways of saying "three!" And that's not all of the complexity - there are also nine ways of making plurals. He comments, "It is beyond my comprehension how a primitive people without the written word can work up such a complicated and complete system of grammar."

Dr. Stetson says that missionaries are often thought of in the minds of those back home as living in grass huts, drawing water from the streams, etc., but "we have a 35-year old brick house in good condition, an indoor toilet, running hot and cold water, and electric lights in the evening from 6:30 to 10 P.M."
Hospital treatments have been increasing about 25% each year, and so I don't have much time to enjoy our comfortable quarters."

When asked about his role as a missionary, he replied, "I definitely feel that the spirit in which our work is done must speak louder than anything else."
Much of the information in this chapter was made available to me by Rear Admiral (ret,) Lewis B. Combs, '16. Admiral Combs served as the Deputy Chief of the Bureau of Yards and Docks of the U. S. Navy from 1938 to 1946. In the Bureau, he played a leading role in the organization and development of the Naval Construction Battalions during the tremendous expansion of that group (Seabees) during World War II. In 1947 upon his retirement from the Navy, he became head of RPI's Department of Civil Engineering, serving in that capacity until 1961. In 1966 the Bureau of Yards and Docks was renamed. Since that time, it has been known as the Naval Facilities Engineering Command (NAVFAC).

Because most of the persons discussed here served when the former title was used, I shall use the former title throughout the chapter.

Since the establishment of the Naval Civil Engineer Corps in 1867, Rensselaer graduates have held prominent places in its ranks. In fact the first college-trained men in the 10-man corps were Rensselaer graduates. One of these was Charles Stratton, Rensselaer 1838. Rear Admiral Mordecai T. Endicott, RPI 1868, became the Civil Engineer Corps first Admiral. This title arose out of his appointment as Chief of the Bureau of Yards and Docks in 1898. Since that appointment, twenty other RPI graduates have served either as Chief or Deputy Chief of the Bureau.

Other Rensselaer graduates in the early days of the Navy Civil Engineer Corps included Ralph G. Packard, 1864, an original CEC officer commissioned in March 1867. Packard served for many years as President of the Rensselaer Alumni Association
and he is credited with having fostered RPI's close association with the U. S. Navy. Other RPI alumni who were among the first in the Corps included Franklin D. Prindle, 1863, and Aniceto G. Menocal, 1862, who conducted early surveys for the Panama Canal.

When Admiral Endicott retired in 1907 because of age, he was succeeded by another Rensselaer graduate, Harry H. Rousseau, 1891. Rousseau became the youngest rear admiral in U. S. Naval history. He was the brother of William (Billy) Rousseau who served so many years as a Professor of Civil Engineering at Rensselaer. Harry Rousseau was succeeded by another Rensselaer graduate, Rear Admiral Frank T. Chambers, 1892.

Two RPI graduates of the Class of 1915 who joined the Corps in 1917 during the beginning of World War I were J. J. Manning and E. H. Praeger. Jack Manning, who retired as a Vice Admiral, was promoted to the rank of Rear Admiral in 1943 and served as Chief of the Bureau of Yards and Docks from 1945 to 1949. Emil Praeger, who returned to the Corps as a Captain in World War II, from his position as head of RPI's CE Department, was in charge of the design and construction of the protected landing harbour built during the invasion of Normandy. This was truly one of the great engineering feats of that or any previous war. In honor of this and other achievements, Rensselaer awarded him the honorary degree of Doctor Engineering in 1954. Other Naval personnel who have received honorary degrees from RPI were: Rear Admiral Norman Smith, Vice Admiral J. J. Manning, Rear Admiral Combs, and Rear Admiral A. C. Husband.

Following are the 21 names of the Rensselaer alumni
who served as Chief or Deputy Chief of the Bureau of Yards and Docks:

Rear Admiral M. T. Endicott, Class of 1868
Rear Admiral H. H. Rousseau 1891
Rear Admiral F. T. Chambers 1892
Rear Admiral C. W. Parks 1884
Captain G. A. McKay 1894
Captain P. A. Reed 1894
Rear Admiral N. M. Smith 1910
Captain G. Duncan 1912
Vice Admiral J. J. Manning 1915
Rear Admiral L. B. Combs 1916
Rear Admiral J. R. Perry 1926
Rear Admiral R. H. Meade 1929
Commodore A. D. Hunter 1930
Rear Admiral A. J. Fay 1932
Rear Admiral J. F. Jelley 1932
Rear Admiral A. C. Husband 1939
Rear Admiral J. V. Bartlett 1945
Rear Admiral A. R. Marschall 1948
Rear Admiral D. G. Iselin 1948
Rear Admiral K. P. Sears 1949
Rear Admiral E. H. Thiele 1949 (U.S. Coast Guard)
Rear Admiral W. P. Zobel 1955

Other Rensselaer graduates attaining the rank of Rear Admiral although they were not in the Civil Engineering Corps or
the Naval Facilities Command were: Kirby Smith '10, Henry G. Taylor '12, Gaylord Church '13, Henry F. Bruns '14, James T. Matthews '18, James D. Wilson '21, C. C. Seabury '28, C. L. Strain '29, H. B. Jones '32, William C. Church '38. (Bill Church was the son of Gaylord Church '13.) and Lewis A. Hopkins '47.

Twentieth century graduates who attained the rank of Brigadier General or higher in the U. S. Army include Brigadier General Franklin Babcock '07, Brigadier General Lester Higbee '12, Brigadier General Rosswell Hardy '14, who was elected an RPI trustee in 1946, and Major General T. F. Farrell '21 who is discussed elsewhere in this book. The Rensselaer Class of 1922 included a group of graduates whose studies and training at the U. S. Military Academy at West Point had been interrupted by World War I. Because they had served in the Corps of Engineers, they were sent to Rensselaer to continue their educations. Many of them went on to brilliant careers in the U. S. Army. The following attained the rank of Major General: C. G. Holle, Edmond H. Leavey, whose career is discussed elsewhere in this book, E. C. Plank, B. L. Robinson and J. S. Seybold. Those who attained the rank of Brigadier General were: W. W. Bessell and Arthur McCullough. Rensselaer awarded the honorary degree of Doctor of Engineering in 1960 to General Bessell. He had served as Dean of the Academic Board of the U. S. Military Academy from 1959 to 1964.

Colonel Donald J. Leehey, RPI '22 also graduated from West Point and the University of Washington. When he was named
manager of the operations center of the Atomic Energy Commission at Santa Fe, New Mexico, he was called by the Commission "the most indispensable person in the nation's atomic program." He was also referred to as the country's "top nuclear weaponeer."

Presently the highest ranking Rensselaer alumnus in the U. S. Armed Forces is Air Force General (four-star) John W. Pauley '44.

Slightly over 4,000 Rensselaer alumni participated in the armed forces in World War II. Of these 2,000 were in the Army, 1800 in the Navy, 125 in the Marines, and 75 in other U. S. and foreign service special corps. The death toll was 94, with 72 army deaths, 19 Navy, two Marines, and one Coast Guard.
Successful People on Success

Success is a moving target. It is different for different people. And it is also different for the same person at different times. Each of us chooses the mountain we attempt to climb and the route up it we take. Sometimes when we get near the top we discover that we chose the wrong mountain or the wrong way up. But in the eyes of the world, the mere fact that we have reached a certain altitude signifies that according to the world's standards we have been successful.

Because this book has presented sketches of people who reached lofty altitudes, and because these people by invitation have told us what they believe to be the factors that made their climbs successful, it might be profitable to consider what they have said about success.

Some people took great pride and comfort in their achievements. A few regarded them as exercises in futility. Many people felt as one alumnus put it—"I felt that I had a tiger by the tail and didn't dare to let go. I was also curious as to where he would take me." One man strongly advised his son not to make the attempt to climb the corporate ladder, but to no avail. The ladder was there. And the son felt he must attempt the climb.

From the nearly 100 comments on success and the factors contributing to it, I have compiled a list of 48 qualities. Here they are. There will be some comments about some of them later.
Forty-Eight Factors for Success

Personal

The habit of working hard
Abundant health and energy
Ability to relate to people
Good personal appearance
Good manners
A disciplined use of time
A positive self-image
Willingness to take risks
Dissatisfaction with the status quo
Desire to seek new challenges
Desire to manage or direct
Ability to accept defeat and learn from it
Ability to learn from success
Ability to free one's self from self-imposed limitations
Ability to do one's job with a minimum of supervision
A strong but not belligerent defense of one's position and convictions
Flexibility - ability to change one's stance when more information warrants it

Attitude

Ability to inspire and be inspired
Breadth of interests beyond one's field
Sense of humor
Strong ethical code
Idealism
A conviction that one is serving humanity
Willingness to sacrifice what one is to what one might become
An ability to empathize with one's associates and fellow-workers

Intellectual Qualities

Ability to organize information and sort out fact from fiction
Ability and willingness to reach a decision on insufficient evidence
Ability to allocate priorities
Ability to develop or derive essential formulas or modes of operation
The knack of finding simple solutions to complex problems
The ability to listen and remember
Knowing what one doesn't know or what one doesn't do well
Education and Experience

A thorough grounding in the fundamentals of one's profession
An education that is abreast or ahead of one's profession
Education and experience that have built self-confidence
in one's professional abilities
Having been a student or disciple of an outstanding person
in one's profession
Having associated with experts in the profession

Administrative Talents

Ability to conceptualize - to shed new light on old or present problems
Ability to select and motivate the right people for the right jobs
Ability to function as a coach and educator
A desire to enable subordinates to grow in problem solving ability and in professional knowledge
An appreciation and open acknowledgment of the contributions of one's colleagues and subordinates
Ability to serve as a role model, personifying what the people in the organization admire and stand for
The guts to seek a new boss if one's boss doesn't have the foregoing qualities

To give you an understanding of the way in which the responses were phrased to the invitation to comment on success and the factors which make for it, here are six typical quotations:

Harry Apkarian, President of MTI

"I believe my achievements are the result of a highly motivated determination to do something meaningful for people, community, school, nation, and society. Whatever progress I have made is largely attributable to the help I have received from many people over many years."

Allen B. DuMont, Founder of DuMont Television

"Beware of negative thinking. Too often the professionally trained engineer knows why something can't be done and let's it go at that. We are surrounded by things 'that couldn't be done.' Yet here they are part of everyday life. They told me it was impossible to build a cathode ray tube. That was my challenge, and fortunately I was able to meet it."
Wallace Rudd, Inventor and Equipment Manufacturer

"Self-discipline will stand you in good stead all your life. That's probably the most valuable thing I learned at RPI."

J. Robert Gilchrist, President, New Jersey Society of Architects

"Perhaps in this day and age it is unusual to feel it is still important that manners and morals be given a prominent position among those characteristics that I feel lead to success. The development of an appropriate ethical code is mandatory, particularly in the categories of personal integrity and honesty."

Chauncey Starr, President, Electric Power Institute

"The wartime responsibility in the Manhattan District Project forced the rapid flowering of my skill in technical management - skills that I had not foreseen. Prior to that time I was a lone researcher looking forward to the quiet life of a professor...It has always been my belief that my education at RPI prepared me in very subtle ways to perform exceptionally."

Walter J. Fallon, Chairman of the Board, Eastman Kodak Company

"Never duck a challenging assignment...recognize that every company sponsors competition among peers. The 'system' is designed to find and reward contributors, passing by those who choose to 'drop out' of the competition...I think we all owe much to a school like Rensselaer that made so many correct decisions about academic standards, curricula, and educational emphasis. I know I do."

By and large successful people throughout the world, regardless of race, religion, background, color, or customs admire and respect each other...They seem to recognize instinctively the commitment of excellence in others that they have made for themselves. It is this commitment, this adherence to a high standard of performance that is perhaps the most outstanding characteristic of successful people.
Obviously most successful people know that they are successful and that, as a result, false modesty is inappropriate and unbecoming. On the other hand, few successful people flaunt their success. They are either too busy hanging onto the tail of the tiger or searching for another tiger tail.

Here is one parting remark about success. By far the greatest amount of learning that we do results from our successes, not our failures. There are limitless ways to fail, but only a few ways to succeed. Although failure may teach us not to try "that" again, there are so many other "thats" that the knowledge we get isn't very useful. Success, on the other hand, genuinely teaches us; furthermore, it gives us confidence and a positive self-image. Having won a prize, we go out and seek other prizes.
Appendix I

How the People Were Selected

Chapters on Industry and Public Utilities - President or Chairman of a Large (Fortune 500) Company

Chapter on Company Founders - Self-Evident

Engineers - Membership in National Academy of Engineering or equivalent

Scientists - significant achievements as evidenced by honors, publications, patents, scientific community recognition.

Architects - Fellowship in AIA or equivalent as evidenced by prizes, awards, professional society leadership

Non-technologists - a variety of criteria depending upon the field of activity such as an editorship, position in a publishing company, professional recognition, honors and awards.

Public Service - Professional Leadership as evidenced by position in government, professional societies, participation in professional leadership, consulting activities

Officers of Associations - Self-evident

Education - College Presidency or membership in NAE

The list of people proposed for the book was submitted to the Trustees Committee on Alumni Affairs and approved by it. The Academic Deans of each of Rensselaer's schools were consulted and they in turn elicited suggestions from their faculties. Persons included in the book were asked to suggest names of associates whom they believed merited consideration for inclusion
Each biography of a living alumnus was submitted to the biographee for corrections, additions, deletions and accuracy of interpretation.
# Appendix II

## Rensselaer Trustees

### Years of Service from 1924

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<tr>
<th>Name</th>
<th>Years</th>
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<td>Henry Colvin</td>
<td>1925-1936</td>
<td>Earl D. Rhodes</td>
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<td>Livingston W. Houston</td>
<td>1925-1968</td>
<td>Fred Denig</td>
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<td>George T. Horton</td>
<td>1925-1945</td>
<td>John F. Kelly</td>
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<td>John W. Doty</td>
<td>1925-1949</td>
<td>Isaac Arnold</td>
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<td>Ralph G. Packard</td>
<td>1926-1927</td>
<td>John J. Manning</td>
<td>1948-1952</td>
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<td>Daniel L. Turner</td>
<td>1927-1930</td>
<td>Ralph Earle</td>
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<td>Thomas Earle</td>
<td>1928-1943</td>
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<td>William P. Creager</td>
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<td>1980-</td>
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</tr>
</tbody>
</table>

May 8, 1980
INDEX

-A-

Abegg, Martin G., 214
Allen, Wells P., Jr., 102
Apkarian, Harry, 81
Applegate, Kenneth P., 92
Archer, Hugh, 77
Arzube, Most Rev. Juan, 178

-B-

Babcock, Brig. Gen. F., 293
Bartlett, R. Adm. J.V., 292
Bedford, Clay Patrick, 115
Beinetti, George S., 100
Bessell, Brig. Gen. W.W., 293
Blackburn, James E., 172
Bogdonoff, Seymour, 127
Bohlin, Peter, Q., 166
Brumer, Milton, 112
Bruns, R. Adm. Henry F., 293
Buckley, Edmond C., 273
Bulmer, Joseph J., 212

-C-

Capwell, George L., 98
Chambers, R. Adm. Frank T., 292
Chin, Carolyn, 103
Church, R. Adm. Gaylord, 293
Church, R. Adm. William C., 293
Clarke, Harry J., 61
Cluett, Sanford, 68
Colvin, Allan D., 89
Combs, R. Adm. Lewis B., 290
Corey, William S., 255
Cortright, Edgar M., 37

-D-

Daly, John F., 33
Davies, Clarence E., 234
Debacher, Donald E., 47
DeMaria, Anthony J., 138
Devine, Frank J., 282
DiNardo, George P., 262
DuMont, Allen B., 70

-E-

Endicott, R. Adm. Mordecai, 292
Epremian, Edward, 248
Estabrook, Ronald, 148

-F-

Fallon, Walter A., 31
Fairwell, Maj. Gen. T.F., 293
Fay, R. Adm. A.J., 292
Fitzroy, Nancy Deloye, 52
Fixman, Isadore, 174
Foerster, Bernd, 164
Fopeano, Robert, 86
Fries, Vollmer W., 18

-G-

Gerber, Heinz Joseph, 83
Giaever, Ivar, 151
Gibson, Raymond W., 96
Gilchrist, J. Robert, 159
Graham, Lois, 245
Griffis, John H., 163

-H-

Hait, James M., 20
Hamilton, Edward P., 170
Hardy, Brig.Gen. Roswell Hardy, 293
Harris, Stephen, 210
Harwood, Edward C., 252
Haselton, William R., 40
Hassan, Alexander, 239
Haus, Hermann A., 207
Hawkins, W. Lincoln, 141
Higbee, Brig.Gen. C.G., 293
Hilbert, Guido E., 270
Holle, Maj. Gen. Lester, 293
Holmer, Edwin C., 147
Hopkins, R. Adm. Lewis A., 293
Horton, George Terry, 59
Horton, John T. Horton, 63
Houston, Livingston, 225
Hunter, Comdr. A.D., 292
Husband, R. Adm. A.C., 292
<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Page</th>
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<tbody>
<tr>
<td>Irving, Walter E.</td>
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<td>Iselin, R. Adm. D.G.</td>
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<td>Jelley, R. Adm. J.F.</td>
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<td>Jones, R. Adm. H.B.</td>
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<td>Jonsson, Erik</td>
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<td>Josefowitz, Samuel</td>
<td>176</td>
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<td>Jurgen, Ronald K.</td>
<td>185</td>
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<th>Age</th>
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<td>Kardys, Joseph A.</td>
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<td>Klima, Otto, Jr.</td>
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<td>Loewy, Robert G.</td>
<td>133</td>
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<td>Meade, R. Adm. R. H.</td>
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<td>143</td>
</tr>
</tbody>
</table>
-S-

Smith, Ralph Carlisle, 195
Smith, R. Adm. Kirby, 293
Smith, Rear Adm. Norman M., 190
Smith, R. Adm. Norman M., 292
Spear, Michael D., 168
Starr, Chauncey, 242
Starr, Malcolm, 180
Stephens, Donald J., 153
Stetson, Kirk R., 287
Stevens, William D., 29
Strain, R. Adm C. L., 293

-T-

Tallamy, Bertram D., 119
Taylor, R. Adm. Henry G., 293
Thiele, R. Adm. E. H., 292
Thompson, Meredith H., 277
Thomsen, Carl J., 257
Tod, G. Robert, 266
Town, George R., 237

-Y-

Van Note, William Gardner, 192
Voorhees, Alan M., 129

-W-

Wechsler, Gilbert, 186
Widmer, Robt. H., 125
Williams, Donald J. 157
Wilson, R. Adm. James D., 293
Woll, Edward, 131

-Z-

Zobel, R. Adm. W. P., 292