Table of Contents

CHAPTER IV. INVESTIGATION OF AVIATION FUELS BY THE ARMY: INDUSTRY COOPERATION IN MEETING ARMY SPECIFICATIONS, 1928-1938 . . . . 591
- Early Fuel Testing, 591; Benzol Blends, 591; Fundamental Importance of Relation of Engine Temperature to Relative Fuel Behavior, 592; Large Amount of Fuel Testing, 593; Advantages of Supercharger, 594; on the radial engine, 594; the Pratt & Whitney Way, 595; Choice of Fuel Components, 595; Army Plan to Use Lead, 595; Army specifications using octane number, 596; oil industry meets needs, 597; difficulties with leaded fuels, 597; demand for lead-free high PN fuel, 598

V. GOVERNMENT AND BUSINESS RELATIONSHIPS IN THE DEVELOPMENT OF AVIATION FUELS, 1932-1938 . . . . 600
- CFR-AFD Programs, 600; Available Components for Producing Fuels, 601; The Role of Isocyanate in Producing Superior Fuels, 601; Proposed PWA Project, 602; Efforts at Wright Field to Increase Further Fuel PN, 603; “Army Method” 100 PN fuel, 605; production of 100 PN, 605; conflict of Army General Staff and Wright Field over 100 P,N, 607; Development of Methods of Producing Octane, 608; testing of fuel components, 608; diisopropyl ether, 609; octane and heptane in full-scale engine testing, 611; Fuel Behavior at Rich Mixture and Lean Mixture: prejudice against aromatics, 613; British preference for sensitive fuels, 613; rich mixture performance, 614; catalytic cracking process, 615; isopentane, 616; research in pure hydrocarbons, 617; projects of the API, 617; Triptane, 618

VI. ENGINE DEVELOPMENT FOR USE OF IMPROVED FUELS . . . . 620
- Exhaust Valves and Spark Plugs: sodium-cooled exhaust valves, 621; development of exhaust valve materials, 621; development of spark plugs, 622; Superchargers and Propellers: need for supercharger development, 626; British experience with superchargers, 626; two-speed superchargers, 627; exhaust turbosupercharger, 628; controllable pitch propellers, 628

VII. AVIATION FUEL DURING WORLD WAR II . . . . 631
- United States Capacity for Production of 100 PN Fuel, 631; Organization for War: Government and Industry, 631

[ xvi ]
<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Hydrocarbons and Chemical Compounds Used in Aviation Fuels, by S. D. Heron</td>
<td>693</td>
</tr>
<tr>
<td>Paraffins, 694; Forms of Linkage, 697; Olefins, 698; Aromatics, 699; Other Fuel Compounds: alcohols, 700; ethers, 701; aromatic amines, 701; lead antiknock compound, 702; Manufacture of Isooctanes: original processes used by Edgar, 703; hot acid and phosphoric acid processes, 703; alkylation process, 704</td>
<td></td>
</tr>
</tbody>
</table>

INDEXES (airplanes, engines, general) | 707 |