

# Contents

## **Part I Eminent Scientists of the Past**

|   |           |
|---|-----------|
| <b>Lagrange as a Historian of Mechanics . . . . .</b>   | <b>3</b>  |
| Agamenon R.E. Oliveira  |           |
| <b>Giuseppe Antonio Borgnis and His Handbook of Machine Designs . . . .</b>                     | <b>15</b> |
| Marco Ceccarelli  |           |
| <b>Tribute to Reuleaux . . . . .</b>  | <b>35</b> |
| Roberto Bragastini  |           |
| <b>Elia Ovazza, Professor of TMM in Palermo Around the End<br/>of the 19th Century. . . . .</b> | <b>47</b> |
| Marco Ceccarelli, Francesco Sorge and Giuseppe Genchi   |           |
| <b>Academician K.V. Frolov at Bauman Moscow State Technical<br/>University. . . . .</b>         | <b>65</b> |
| Olga Egorova and Gennady Timofeev   |           |

## **Part II History of Industrial Installations**

|  |            |
|--|------------|
| <b>Historical Watermills. Architectural, Mechanical and Hydraulic<br/>Heritage . . . . .</b> | <b>81</b>  |
| Mario Centofanti, Stefano Brusaporci and Vittorio Lucchese                                   |            |
| <b>The Mill at the Orbetello Lagoon: Mechanisms<br/>and Hydraulic Energy. . . . .</b>        | <b>99</b>  |
| Emanuela Chiavoni  |            |
| <b>The Sulphur Mining Industry in Sicily. . . . .</b>  | <b>111</b> |
| Vincenzo Ferrara   |            |
| <b>The History of Aircraft Manufacturing at the Braşov IAR Plant. . . . .</b>                | <b>131</b> |
| Horia Salcă and Dan Săvescu  |            |

|   |            |
|---|------------|
| <b>Science, Technology and Industry in Southern Italy Before the Unification . . . . .</b>  | <b>159</b> |
| Cesare Rossi and Marco Ceccarelli   |            |
| <b>Medium Size Companies of Mechanical Industry in Northern Italy During the Second Half of the 19th Century . . . . .</b>                              | <b>181</b> |
| Yibing Fang and Marco Ceccarelli  |            |
| <br><b>Part III History of Machinery and Transport</b>  |            |
| <b>The Museum of Engines and Mechanisms. More Than a Century of History of Technology . . . . .</b>   | <b>201</b> |
| Riccardo Monastero and Giuseppe Genchi  |            |
| <b>History of the Trains Used on the Spanish Railway Line Madrid–Almorox . . . . .</b>  | <b>227</b> |
| Daniel Fernández Caballero, Víctor Rodríguez de la Cruz,<br>Julián Martín Jarillo and Manuel Esperón Miguez   |            |
| <b>Airship—The American Dream by Quirico Filopanti, 1851 . . . . .</b>  | <b>241</b> |
| Pier Gabriele Molari  |            |
| <br><b>Part IV Human Inventiveness for Mechanical and Scientific Devices</b>  |            |
| <b>Archimedes’ Screw in the Four Books “De Cochlea” by Guido Ubaldo del Monte [Santa Maria]—Venice—1615: The Engineering and the Language . . . . .</b> | <b>255</b> |
| Elena Magnini and Pier Gabriele Molari  |            |
| <b>On the Birth and Growth of Pendulum Clocks in the Early Modern Era . . . . .</b>   | <b>273</b> |
| Francesco Sorge, Marco Cammalleri and Giuseppe Genchi   |            |
| <b>Machine Designs and Drawings in Renaissance Editions of de Architectura by Marcus Vitruvius Pollio . . . . .</b>                                     | <b>291</b> |
| Michela Cigola and Marco Ceccarelli   |            |
| <b>Trompes or Water Bellows. A Way of Producing Wind Through the Fall of Water . . . . .</b>  | <b>309</b> |
| Umberto Meneghetti  |            |
| <b>Determination of Torsional Stresses in Shafts: From Physical Analogies to Mathematical Models . . . . .</b>  | <b>327</b> |
| Augusto Ajovalasit, Vincenzo Nigrelli, Giuseppe Pitarresi<br>and Gabriele Virzì Mariotti  |            |

**Part V   Robots and Human-Driven Automata**

**The Automaton Nysa: Mechanism Design in Alexandria  
in the 3rd Century BC . . . . .** 347  
Teun Koetsier and Hanfried Kerle

**Hindu Temple Carts—Rathams . . . . .** 367  
J.S. Rao, Babaji Raja Bhonsle and Bigil Kumar

**Robots: An Evolving Species . . . . .** 389  
Alberto Rovetta and Vincenzo Iannone

Essays on the History of Mechanical Engineering

Sorge, F.; Genchi, G. (Eds.)

2016, XI, 409 p. 322 illus., 180 illus. in color., Hardcover

ISBN: 978-3-319-22679-8