stars were shining brightly to the north. The moon, which was very low in the west (about 15° south of west, with an altitude of some 5° or 6°), was hidden from view by buildings, where I stood; and, because of the street lights, I was not even aware that the moon was out until the rainbow in the east caught my eye. None of the prismatic colors could be detected, the bow being merely a yellowish arch of light very well defined at the southern end—rather an odd thing to see at that time of night.

FRANK L. GRIFFIN

REED COLLEGE,
PORTLAND, ORE.

SCIENTIFIC BOOKS

Gli Scienziati Italiani, dall'inizio del medio evo ai nostri giorni. Repertorio biobibliografico dei filosofii, matematici, astronomi, fisici, chimici, naturalisti, medici, e geografi Italiani. Diretto da ALDO MIELI, e compiuto con la collaborazione di numerosi scienziati, storici, e bibliografi. Vol. I., Parte I., Rome, 1921. Pp. viii + 236. A. Nardecchia, publisher.

In the issue of SCIENCE of August 30, 1919, pp. 213–214, I called attention to Italian activity in the field of the history of science, evidenced by the new publication *Archivio di Storia della Scienza,* edited by Aldo Mieli, which journal has now completed its first year. The present work indicates the continued and growing interest in Italy in the history of science.

The first part of this biographical dictionary presents the biographies of thirty-three Italian scientists from the fifteenth to the present century. The list of contributors to the volume shows that the great scholars of Italy are devoting themselves to assure the success of the present work under the able editorship of the distinguished historian of science, Aldo Mieli.

One peculiarity of the work is that neither chronological nor alphabetical order of treatment is pursued in selecting the scientists included. Eventually, of course, the completed work will be provided with all necessary indices. Each volume includes also the alphabetical index of names.

The order of treatment of each biography consists of the following: Life; Works, including a critical discussion of the historical and scientific significance; Bibliography, including complete catalogue of all works, with place and date of printing of published works, editions, and translations with precise bibliographical descriptions and also some statement of location in Italian libraries of volumes mentioned; Literature, giving lists of works which discuss the work or life of the scientist in question.

The mathematician will welcome the fine biographical statement (pp. 4–12) concerning Leonardo Fibonacci, written by Gino Loria; the astronomer will appreciate the excellent account (pp. 45–67) of Schiaparelli, by Elia Millosevich; the geographer and the astronomer will find much of interest in the account (pp. 101–111) of Giovanni Antonio Magini (1555–1617) by Antonio Favaro, who lists no less than 47 printed works (and editions) by Magini; the student of medical history, the botanist and naturalist and the physicist will enjoy a whole series of illuminating articles. Particularly noteworthy is the fact that a photograph and a facsimile of handwriting is given of each scientist, wherever possible.

This publication promises to be a work comparable only to the English Dictionary of National Biography; for America, France or Germany there is no work of this nature. When completed on present plans libraries will find it as indispensable as the above mentioned dictionary.

With the present state of exchange the price of 45 liras for Part I., viii plus 236 pages, is extremely low. Every effort should be made by American scientists, historians, and librarians to encourage the continuation of this publication on the present scale. The effective way to do this is by subscription to the publisher, A. Nardecchia, Via dell' Universita 11–14, Rome, Italy.

The alphabetical list of articles follows:

Acri, Francesco (1834–1913), philosopher, by E. P. Lamanna.

Alpino, Prospero (1553–1616) botanist, by A. Beguinot.
Amici, Giovanni Battista (1786–1863) physicist. naturalist, by G. B. De Toni.
Anguillara, Luigi (c. 1512–1570) botanist, by G. B. De Toni.
Baranzano, Redento (1590–1622) philosopher, astronomer, by G. Boffito.
Bertini, Anton Francesco (1658–1726), physician, by A. Corsini.
Bertini, Giuseppe (1772–1845) physician, by A. Corsini.
Bertini, Giuseppe Maria Saverio (1694–1756), physician, by A. Corsini.
Biringuccio, Vannoccio (1480–1530?), technician, chemist, by A. Mieli.
Cestoni, Diacinto (1637–1718), naturalist, by G. Stefanini.
Chiarugi, Vincenzo (1759–1820) psychiatrist, physician, by A. Vedrani.
Cocchi, Antonio (1695–1758), physician, by A. Corsini.
Corti, Bonaventura (1729–1813), botanist, by G. B. De Toni.
Cotugno, Domenico (1736–1822), physician, by G. Bilancioni.
De Visiani, Roberto (1800–1878), botanist, by A. Beguinot.
Dini, Ulisse (1845–1918), mathematician, by G. Loria.
Fibonacci, Leonardo (sec. xii–xiii), mathematician, by G. Loria.
Figari, Antonio (1804–1870) traveler, naturalist, by G. Stefanini.
Folli, Francesco (1624–1685), physician, naturalist, by G. Goretti-Miniati.
Ghini, Luca (c. 1490–1556), botanist, by G. B. De Toni.
Guilandino, Melchiorre (c. 1520–1589), botanist, by G. B. De Toni.
Inghirami, Giovanni (1779–1851), astronomer, by G. Giovannozzi.
Magini, Giovanni Antonio (1555-1617), astronomer, geographer, by A. Favaro.
Maranta, Bartolomeo (c. 1500–1511), physician, botanist, by G. B. De Toni.
Moletti, Giuseppe (1531–1588) astronomer, cosmographer, by A. Favaro.
Passerini, Giovanni (1816–1893), botanist, by G. B. De Toni.
Piccone, Antonio (1844–1901), botanist, by G. B. De Toni.
Pontedera, Giulio (1688–1737), botanist, by A. Beguinot.
Riva, Giovanni Guglielmo, (1627–1677), physician, by C. Artom.
Schiaparelli, Giovanni Virginio (1835–1910) astronomer, historian of science, by E. Millosevich.
Silvestri, Francesco (1474–1528), philosopher, by G. Sestili.
Sterzi, Giuseppe (1876–1919), anatomist, by G. Favaro.
Valli, Eusebio (1755–1816), physician, by A. Vedrani.
Zanardini, Giovanni (1804–1878), physician, botanist, by G. B. De Toni.

Louis C. Karpinski
University of Michigan

SPECIAL ARTICLES

THE EINSTEIN SOLAR FIELD AND SPACE OF SIX DIMENSIONS

The Einstein theory is four-dimensional in the sense that four (general or world) coordinates x_1, x_2, x_3, x_4 are employed. The fundamental quadratic form

$$ds^2 = \Sigma g_{ik} dx_i dx_k,$$

where the ten potentials g_{ik} are functions of the four coordinates, in general has a curvature tensor which does not vanish, and therefore defines a curved manifold M of four dimensions. In fact M is flat or euclidean or homodoidal only when there is no actual gravitation. Excluding this trivial case, the question arises what is the flat space of fewest dimensions n, which can be regarded as containing the curved manifold M?

Abstractly considered the possible values of n are 5, 6, 7, 8, 9, 10; that is, any M can surely be immersed in a flat space of not more than 10 dimensions. But if we take into account Einstein's differential equations of gravitation, $R_{ik} = 0$, or $G_{ik} = 0$, we find that the simplest case, $n = 5$, is actually impossible. That is to say: