

**World Scientific 388pp , 1995**

## **GEOMETRY, ANALYSIS AND MECHANICS**

edited by **John M Rassias** (*The National University of Athens*)

This review volume consists of articles by outstanding scientists who explore Archimedes' influence on the development of mathematics, particularly on Geometry, Analysis and Mechanics.

### **Contents:**

- Towards the Ultimate Scheme for Numerical Integration in Multi-Dimensions (C D Angelopoulos & V D Angelopoulos)
- On a Simplified Quasilinear Equation of Elasticity Theory (L Berg & K Frischmuth)
- The Euler Formula for Polyhedra and Functional Equations (E Castillo & R Ruiz-Cobo)
- Relative Homotopy Groups in Unirational Homotopy Theory (P Cherenack)
- Discrete and Non-Discrete Phenomena in the Mixed Problem (C-Q Wu & Y K Liu)
- A WZ Proof of Ramanujan's Formula for  $\pi$  (Sh B Ekhad & D Zeilberger)
- Problems on the  $n$  Dimensional Simplex (K Hatada)
- The Two Squares Theorem (P Karagiorgis & K Markata)
- Archimedes and the Invention of Burning Mirrors: An Investigation of Work by Buffon (E Kreyszig)
- A Problem which Archimedes would Probably Like (S Tabachnikov)
- Open Problems in Analysis (J M Rassias)
- and other papers

**Readership:** Students and researchers in mathematics, mechanics and mathematical physics.

**References for Archimedes**

**By: School of Mathematics and Statistics**

**University of St Andrews, Scotland**

1. Biography in *Dictionary of Scientific Biography* (New York 1970-1990).
2. Biography in *Encyclopaedia Britannica*.

### Books:

3. A Aaboe, *Episodes from the early history of mathematics* (Washington, D.C., 1964).
4. R S Brumbaugh, *The philosophers of Greece* (Albany, N.Y., 1981).
5. H Bernhard, Archimedes, in H Wussing and W Arnold, *Biographien bedeutender Mathematiker* (Berlin, 1983).
6. E J Dijksterhuis, *Archimedes* (Copenhagen, 1956 and Princeton, NJ, 1987).
7. T L Heath, *A history of Greek mathematics II* (Oxford, 1931).
8. J Hjelmslev, Über Archimedes' Grössenlehre, *Danske Vid. Selsk. Mat.-Fys. Medd.* **25** (15) (1950).
9. W R Knorr, Archimedes and the pseudo-Euclidean 'Catoptrics': early stages in the ancient geometric theory of mirrors, *Arch. Internat. Hist. Sci.* **35** (114-115) (1985), 28-105 (1986).
10. S Ya Lur'e, *Archimedes* (Russian) (Moscow-Leningrad, 1945).
11. E Rufini, *Il "metodo" di Archimede e le origini del calcolo infinitesimale nell'antichità* (Milan, 1961).
12. I Schneider, *Archimedes : Ingenieur, Naturwissenschaftler und Mathematiker* (Darmstadt, 1979).
13. E S Stamatis, *The burning mirror of Archimedes* (Greek) (Athens, 1982).

### Articles:

14. A Aaboe and J L Berggren, Didactical and other remarks on some theorems of Archimedes and infinitesimals, *Centaurus* **38** (4) (1996), 295-316.
15. A R Amir-Moéz, Khayyam, al-Biruni, Gauss, Archimedes, and quartic equations, *Texas J. Sci.* **46** (3) (1994), 241-257.
16. M Authier, Archimède : le canon du savant, in *Eléments d'histoire des sciences* (Paris, 1989), 101-127.
17. I G Basmakova, Differential methods in the works of Archimedes (Russian), *Istor.-Mat. Issled.* **6** (1953), 609-658.
18. H G Beisenherz, Archimedes und die Protophysik, *Philos. Natur.* **18** (4) (1980/81), 438-478.
19. J L Berggren, Archimedes among the Ottomans, in *From ancient omens to statistical mechanics, Acta Hist. Sci. Nat. Med.* **39** (Copenhagen, 1987), 101-109.
20. J L Berggren, A lacuna in Book T of Archimedes' 'Sphere and cylinder', *Historia Math.* **4** (1977), 1-5.
21. J L Berggren, Spurious theorems in Archimedes' Equilibrium of planes. Book I, *Arch. History Exact Sci.* **16** (2) (1976/77), 87-103.
22. M G Beumer, Archimedes and the trisection of the angle (Dutch), *Nieuw Tijdschr. Wiskunde* **33** (1946), 281-287.

23. S E Brodie, Archimedes' axioms for arc-length and area, *Math. Mag.* **53** (1) (1980), 36-39.
24. P Delsedime, Uno strumento astronomico descritto nel corpus Archimedeo : la dioptra di Archimede, *Physis - Riv. Internaz. Storia Sci.* **12** (2) (1970), 173-196.
25. G Derenzini, L'eliocentrismo di Aristarco da Archimede a Copernico, *Physis - Riv. Internaz. Storia Sci.* **16** (4) (1974), 289-308.
26. E J Dijksterhuis, Die Integrationsmethoden von Archimedes, *Nordisk Mat. Tidskr.* **2** (1954), 5-23.
27. Y Dold-Samplonius, Archimedes : Einander berührende Kreise, *Sudhoffs Arch.* **57** (1973), 15-40.
28. A G Drachmann, Archimedes and the science of physics, *Centaurus* **12** (1967/1968), 1-11.
29. A G Drachmann, Fragments from Archimedes in Heron's Mechanics, *Centaurus* **8** (1963), 91-146.
30. D C Gazis and R Herman, Square roots geometry and Archimedes, *Scripta Math.* **25** (1960), 228-241.
31. G Giorello, Archimede e la metodologia dei programmi di ricerca (Italian : With an English translation), *Scientia (Milano)* **110** (1-4) (1975), 111-135.
32. G Goe, Is Archimedes' proof of the principle of the lever fallacious?, in *1971 Actes XIIe Congrès Internat. d'Histoire des Sciences Tome IV : Histoire des Mathématiques et de la Mécanique* (Paris, 1968), 73-77.
33. A Guzzo, Archimede (Italian), *Filosofia* **3** (1952), 149-168.
34. E Hayashi, A reconstruction of the proof of Proposition 11 in Archimedes's method : proofs about the volume and the center of the gravity of any segment of an obtuse-angled conoid, *Historia Sci.* (2) **3** (3) (1994), 215-230.
35. H Hermelink, Ein bisher übersehener Fehler in einem Beweis des Archimedes, *Arch. Internat. Hist. Sci. (N.S.)* **6** (1953), 430-433.
36. M C Hernández Martín, Sketch of an internal logic in the works of Archimedes (Spanish), *Arch. Hist. Exact Sci.* **46** (2) (1993), 139-151.
37. D L Hilliker, A study in the history of analysis up to the time of Leibniz and Newton in regard to Newton's discovery of the binomial theorem II : Contributions of Archimedes, *Math. Student* **42** (1974), 107-110.
38. J Hjelmslev, Eudoxus' axiom and Archimedes' lemma, *Centaurus* **1** (1950), 2-11.
39. J E Hofmann, Über Archimedes' halbbregelmässige Körper, *Arch. Math.* **14** (1963), 212-216.
40. S H Hollingdale, Archimedes of Syracuse : a tribute on the 22nd century of his death, *Bulletin Institute of Mathematics and its Applications* **25** (9) (1989), 217-225.
41. S H Hollingdale, Archimedes of Syracuse : a tribute on the 22nd centenary of his death, *Bull. Inst. Math. Appl.* **25** (9) (1989), 217-225.
42. J Itard, Quelques remarques sur les méthodes infinitésimales chez Euclide et Archimède, *Rev. Hist. Sci. Appl.* **3** (1950), 210-213.
43. W R Knorr, On an alleged error in Archimedes' 'Conoids'. Prop. 1, *Historia Math.* **20** (2) (1993), 193-197.

44. W R Knorr, On Archimedes' construction of the regular heptagon, *Centaurus* **32** (4) (1989), 257-271.
45. W R Knorr, Archimedes' 'Dimension of the circle' : a view of the genesis of the extant text, *Arch. Hist. Exact Sci.* **35** (4) (1986), 281-324.
46. W R Knorr, Archimedes and the pre-Euclidean proportion theory, *Arch. Internat. Hist. Sci.* **28** (103) (1978), 183-244.
47. W R Knorr, Archimedes and the 'Elements' : proposal for a revised chronological ordering of the Archimedean corpus, *Arch. Hist. Exact Sci.* **19** (3) (1978/79), 211-290.
48. W R Knorr, Archimedes and the spirals : the heuristic background, *Historia Math.* **5** (1) (1978), 43-75.
49. W Knorr, Archimedes' lost treatise on the centers of gravity of solids, *Math. Intelligencer* **1** (2) (1978/79), 102-109.
50. W R Knorr, Archimedes and the measurement of the circle : a new interpretation, *Arch. History Exact Sci.* **15** (2) (1975/76), 115-140.
51. W R Knorr, Archimedes' neusis-constructions in spiral lines, *Centaurus* **22** (2) (1978/79), 77-98.
52. G M Kozhukhova, The Arabic version of Archimedes' "Measurement of a circle" (Russian), *Istor.-Mat. Issled.* **25** (1980), 315-316, 380.
53. B I Kozlov, Archimedes and the genesis of technological knowledge (Russian), *Voprosy Istor. Estestvozn. i Tekhn.* (3) (1984), 18-32.
54. E Kreyszig, Archimedes and the invention of burning mirrors : an investigation of work by Buffon, in *Geometry, analysis and mechanics* (River Edge, NJ, 1994), 139-148.
55. W R Laird, Archimedes among the humanists, *Isis* **82** (314) (1991), 629-638.
56. L H Lange, Hommage à Archimède, *Fibonacci Quart.* **19** (3) (1981), 214-219.
57. S Maracchia, Una progressione geometrica in Archimede (Italian), *Archimede* **25** (1973), 314-317.
58. O Neugebauer, Archimedes and Aristarchus, *Isis* **34** (1942), 4-6.
59. C Osborne, Archimedes on the Dimension of the Cosmos, *Isis* **74** (272) (1983), 234-242.
60. C Pereira da Silva, On Archimedes of Syracuse (Portuguese), *Bol. Soc. Paran. Mat.* (2) **8** (1) (1987), 51-68.
61. J H Pérez, The method of Archimedes (Spanish), *Bol. Mat.* **17** (1-3) (1983), 118-139.
62. G M Phillips, Archimedes the numerical analyst, *Amer. Math. Monthly* **88** (3) (1981), 165-169.
63. **J.M.Rassias**, Archimedes, in *Geometry, analysis and mechanics* (River Edge, NJ, 1994), 1-4.
64. T S Sarangov, Archimedes' proof of the lever principle (Russian), in *History and methodology of the natural sciences XXXI* (Moscow, 1985), 89-101.
65. T Sato, A reconstruction of 'The Method' Proposition 17, and the development of Archimedes' thought on quadrature. Why did Archimedes not notice the internal connection in the problems dealt with in many of his works? II, *Japan. Stud. Hist. Sci.* **32** (1987), 75-142.

66. of a circle', Proposition 1 : an attempt at reconstruction, *Japan. Stud. Hist. Sci.* **18** (1979), 83-99.
67. J J Schäffer, The scientific personality of Archimedes (Spanish), *Fac. Ingen. Agrimens. Montevideo. Publ. Didact. Inst. Mat. Estadist.* **1** (1958), 57-93.
68. P Schreiber, A note on the cattle problem of Archimedes, *Historia Math.* **20** (3) (1993), 304-306.
69. P Schultz, Tartaglia, Archimedes and cubic equations, *Austral. Math. Soc. Gaz.* **11** (4) (1984), 81-84.
70. A E Shapiro, Archimedes's measurement of the sun's apparent diameter, *J. Hist. Astronom.* **6** (1975), 75-83.
71. D L Simms, Archimedes' weapons of war and Leonardo, *British J. Hist. Sci.* **21** (69, 2) (1988), 195-210.
72. E S Stamatis, Reconstruction of the ancient text in the Sicilian Doric dialect of fifteen theorems of Archimedes which are preserved in the Arabic language (Greek), *Bull. Soc. Math. Grèce (N.S.)* **6** II (1965), 265-297.
73. C M Taisbak, Analysis of the so-called "lemma of Archimedes" for constructing a regular heptagon, *Centaurus* **36** (3-4) (1993), 191-199.
74. J G Thompson, Archimedes and continued fractions, *Math. Medley* **15** (2) (1987), 67-75.
75. G Vacca, Sugli specchi ustori di Archimede, *Boll. Un. Mat. Ital.* (2) **3** (1940), 71-73.
76. R von Erhardt and E von Erhardt, Archimedes' Sand-Reckoner, *Isis* **34** (1943), 214-215.
77. W C Waterhouse, On the cattle problem of Archimedes, *Historia Math.* **22** (2) (1995), 186-187.
78. A P Yushkevich, On the first Russian editions of the works of Euclid and Archimedes (Russian), *Akad. Nauk SSSR. Trudy Inst. Istorii Estestvoznaniya* **2** (1948), 567-572.
79. S V Zitomirskii, The "celestial globe" of Archimedes (Russian), *Istor.-Astronom. Issled.* **14** (1978), 271-302.