

disparaging both. We should avoid any such confusion, either to disparage or to exalt a theory.

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A SCIENTIST AT PEACE AND AT WAR FOUR HUNDRED YEARS AGO

THE manner in which one great scientist of the past, Nicolò Tartaglia of Brescia (c. 1500–1577), conducted his conscience in the face of the differing requirements of peace and war, may not be without some interest to scientists of the present day who find themselves in a similar situation.

In the "Epistola" to his "Della Nuova Scienza," written at Venice 20 December 1537 (O.S.), and addressed to his Excellency the Duke of Urbino, Tartaglia writes:

When I was living in the town of Verona, Illustrious Duke, one of my intimates, my cordial friend the master of ordnance at the old castle, (a man of experience and great skill in his art, and endowed with an abundance of good qualities), asked me one day my opinion how to aim a piece of artillery to give it the greatest range. Although I had no practical knowledge whatever of artillery, for in truth, Excellent Duke, I have never in my life shot a single round with firearms, arquebus, bombard or musket, nevertheless, being desirous of serving my friend, I promised shortly to give him a definite answer to his question.¹

Tartaglia then proceeds to give an account of his attack upon the problem set him by his friend, and then goes on to remark:

As the result of this I had the intention of writing a treatise on the art of artillery, and to bring it to a degree of perfection capable of directing fire in all circumstances, assisted only by a few particular experiments: for as Aristotle says in the seventh book of the "Physica," Section 20, "particular experiments are the basis of universal science."

But, since then, one day meditating to myself, it had seemed to me that it was a thing blameworthy, shameful and barbarous, worthy of severe punishment before God and man, to wish to bring to perfection an art damageable to one's neighbour and destructive to the human race, and especially Christian men in the wars that they wage on one another. Consequently, not only did I altogether neglect the study of this matter and turned to others, but I even tore up and burnt everything which I had calculated and written on the subject, ashamed and full of remorse for the time I had spent on it, and well decided never to communicate in writing that which against my will had remained in my memory, either to please a friend or in teaching of these matters which are a grave sin and shipwreck to the soul.²

In view, however, of the preparations of the Turks to invade Italy, who, as Professor J. D. Bernal has pointed out,³ were instigated by his Most Christian Majesty the King of France,⁴ Tartaglia suffered a change of mind. He writes:

To-day, however, in the sight of the ferocious wolf preparing to set on our flock, and of our pastors united for the common defence, it does not seem to me any longer proper to hold these things hid, and I have resolved to publish them partly in writing, and partly by word of mouth, for the benefit of Christians so that all should be in a better state either to attack the common enemy or to defend themselves against him. I regret very much at the moment having given up this work, for I am certain that had I persevered I would have found things of the greatest value, as I hope yet to find. . . . I hope that your Lordships will not disdain to receive this work of mine so as better to instruct the artillerymen of your most illustrious government in the theory of their art, and to render them more apt in its practice.⁵

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SCIENTIFIC BOOKS

THE EARTH

Biography of the Earth. By GEORGE GAMOW. 242 pages; 35 plates; 58 figures. New York: Viking Press. 1941. \$3.00.

THE barriers between the sciences are now quite generally down, and no geologist will think that even a professor of theoretical physics is poaching on forbidden territory when he writes such a book as this. On the contrary, geologists will thank Dr. Gamow for

making the history of the earth so interesting to the layman by his lucid, fluent style, his enthusiasm for the subject, and his wise selection of items to be stressed. Certainly, the truly fascinating story of the origin, infancy and adolescence of an earth, still far from decrepit old age, has seldom been told with such verve and ingenuity of phrase, combined with essen-

² *Ibid.*, p. 6.

³ J. D. Bernal, "The Social Function of Science," p. 169. New York: The Macmillan Co., 1939. The second and third parts of the translations here given from Tartaglia are from the version in Bernal's excellent work. The passages are incorrectly attributed by him, on the basis apparently of a French translation, to a section entitled "L'Art de jeter les bombes."

⁴ The modern parallel is, of course, Hitler playing Mephistopheles to Japan's Faust.

⁵ Tartaglia, *loc. cit.*, p. 6.

¹ "Della Nuova Scienza," in "Questi et Invenzioni Diverse de Nicolò Tartaglia, Di nouo restampati con vna Gionta al sesto libro, nella quale si mostra duoi modi & continentia di tutta l'opera nel seguente foglio si trouara notata." [Venezia, 1550], (p. 1). I have not been able to see an earlier edition of this work, and so translate from the only edition available to me.