Stillman Drake. *Galileo Studies*. Ann Arbor: The University of Michigan Press, 1970. Pp. 289. \$8.50.

Over a period of fifteen years, Stillman Drake has published a series of important biographical essays that have shed considerable light on various aspects of Galileo's life and work. The appearance in book form will be welcomed not only by the historian of science but by the general reader who wishes to assess the role Galileo played in the scientific revolution.

Renaissance scholars may be particularly interested in one of Professor Drake's later papers in which he draws attention to the little explored relation between Renaissance music and the rise of experimental science. Between 1585, when he left the University of Pisa, and 1589, when he obtained the chair of mathematics at that University, Galileo lived mainly in Florence, giving private tuition in mathematics. It is precisely during this period that his father, Vincenzo Viviani, carried out a number of experiments to refute the belief that sonorous numbers were the cause of consonance. Referring to the celebrated opinion of Pythagoras that the small-number fractions are always associated with agreeable tones, Vincenzo confirmed that the ratios 2:1, 3:2, 4:3 will give octaves, fifths, and fourths for strings of like material having lengths in these ratios, or for columns of air having similar lengths. But he also showed that the ratio 9:4 was just as closely associated with the fifth as the ratio 3:2, and by implication, the ratio 27:8 — ratios which were proscribed by the musical theorists who believed in sonorous number as a cause. Galileo's father also experimented with strings of different materials and different weights and discovered that unison cannot be consistently obtained between two strings if they differ in any respect. Thus, by depriving number of causal properties, he called attention to the real significance of number as it refers to the specific dimensions of length, surface, volume and weight. We have here a source of his son's interest in the experimental verification of mathematical relationships. The evidence is circumstantial but it is heightened by the fact that Galileo was himself an accomplished musician and that music in the sixteenth century was still considered a special branch of mathematics.

In the introductory essay, the author makes a spirited attack on historians of ideas who interpret and sometimes reconstruct Galileo's scientific thought with the aid of pre-conceived philosophical patterns. Professor Drake himself advocates sticking to the facts, but this reviewer cannot avoid the impression that the facts as he describes them are often observed from a vantage point that is not itself immune from criticism. Whatever its merits, positivism is a philosophical bias, and the reader of *Galileo Studies* will perhaps wish to restore a proper sense of balance by rereading Alexandre Koyré's *Etudes Galiléennes*. Read in conjunction, Koyré's work and Drake's studies will provide excellent material for a stimulating debate on the real nature of Galileo's achievement.

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Robert S. Lopez. *The Three Ages of the Italian Renaissance*. Charlottesville: University Press of Virginia, 1970. Pp. 103.

In this brief volume, the Italian Renaissance, characterized according to the classical three ages of adult human life, emerges as a beautiful but superficial woman who, deluded by "confident expectation" in her youth from 1454-94, fluctuates between self-assurance

and disenchantment in her maturity (1494-1527) and finally, after a period of despondent old age, comes to her death in 1559. Professor Lopez, well-known in the field of mediaeval economic history, has clearly narrowed the Renaissance (which he, contrary to traditional views, maintains to be a period of economic regression¹) to a single century from the fall of Constantinople to the treaty of Cateau-Cambrésis, thus excluding the period of civic humanism usually considered an important part of the early Renaissance. He compares the very "youth" of the Renaissance to an Indian summer, giving the reader the impression that it was simply the end of a more glorious era.

The second organizing metaphor which utilizes the analogy of three, is that of the triptych. This image seems to confirm Burckhardt's view of the Renaissance as a work of art. On closer examination, however, it proves to be a less positive consideration of the era as a beautiful but superficial expression of what was already known and felt in the Middle Ages.

In his analysis of each age Professor Lopez, adhering to his belief that "it would be completely artificial, and so completely false to attempt to portray an age without taking material conditions into account,"² links the economic and political aspects to the ideological and cultural ones, concluding each major chapter with his own able translation of a contemporary poem (e.g. Lorenzo de' Medici's "Canzona di Bacco") intended to sum up the spirit of the times.

On the basis of economic data he has succeeded in destroying the myth of unlimited artistic patronage in the Renaissance. However his method does not bring forth original interpretations of the literary and artistic works he discusses: rather, it establishes a forced relationship between material and intellectual currents. For instance, there is an almost deterministic postulation that the financial depression of the cities sparked a speculative interest in the countryside which, in turn, was responsible for the growth of pastoral literature. This exaggeratedly "realistic" attitude is especially evident in the iconoclastic modern idiom used throughout the book.

What were undoubtedly, in their original form, entertaining lectures, have been brought together, and supplemented with a good bibliography and numerous plates of artistic masterpieces, to form a general picture of the Italian Renaissance which at first is dazzling but then reveals its one-dimensional (mainly economic) inspiration and stress.

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Notes

¹ Robert S. Lopez, "Hard Times and Investment in Culture" in *The Renaissance: Six Essays* by W.K. Ferguson, etc. New York, Harper, 1962, pp. 29-54.

² Robert S. Lopez, *The Birth of Europe*. London, Phoenix, 1966, p.2.

Robert J. Rodini. *Antonfrancesco Grazzini, Poet, Dramatist, and Novelliere*. Madison: University of Wisconsin Press, 1970. Pp. xv, 242. \$12.50.

By combining under the same cover a study of Antonfrancesco Grazzini as a poet, a dramatist and a writer of short stories, Professor Rodini has made a useful, if somewhat limited, contribution to the study of Italian Renaissance literature. In the past, critics have con-