If Leonardo had gained a commission at the Sforza Court for a series of siege engine designs—among other tasks—he could have begun working on many of these designs as early as 1483. The following discussion outlines the documentary evidence of the drawings and writings associated with the development of the *Giant Crossbow* presentation drawing.

An appealing feature of the crossbow—at least to Leonardo—appears to have been its bat wing shaped armature. The early bat wing studies on MS B 74r (diagram, Fig. 2.1), 89v, and 100v are not specifically about the *Giant Crossbow*, but instead refer to the bat wing’s structure. The following analysis offers proof of the relationships between these wing studies, other military studies, and the *Giant Crossbow* design. At issue is the extent to which these and many of the following military studies were part of the same project for Ludovico Sforza, as noted further above with reference to Leonardo’s letter of c. 1484.

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**Fig. 2.1.** Illustration of Leonardo’s flying machine wing on Manuscript B, MS B.N. It. 2037, f. 74r, Institut de France, Paris

Manuscript B

An examination of the contexts for many of these military studies indicates that they are limited to three contiguous quires at one end of a group of ten quires, entitled "Manuscript B" by Giambattisa Venturi in 1796. Each "quire" or booklet originally had five folded bifolia (two folios per sheet), making a total of ten folios (twenty sides of ten pages) per booklet. The last three quires have siege engine designs and other strategies for defence and attack by air, sea, land, and tunnelling. These relate to very similar drawings in the Codex Atlanticus, Windsor Royal Library, Turin Royal Library, the Accademia in Venice, the British Museum in London, and the École Nationale Supérieure des Beaux-Arts in Paris.

Compare for example the similar draughting styles and subjects in these drawings: CA 113v [40va], Catapults and a Horse with three lances, BM Scythed chariot, armoured vehicle and halberd; T 15583r, Scythed chariots; W 12653r, Battle Chariot, a Soldier with Shield, and a Horsemam with Three Lances; and MS B Ashburnham f. A.2, Halberds. Also, with regard to the surface treatment of these drawings that will be discussed further below, metal stylus lines on the Turin Scythed Chariots (15583r) resemble similar preparatory marks on the Giant Crossbow drawing and its neighbouring military engineering studies between CA 143r [51rc] and 166r [59vb]. These are early examples of Leonardo’s use of a metal stylus with a straight edge. A good example of a freehand drawing with metal stylus is on page 99 of the Codex Trivulziano (previous 54r; see dia-

Fig. 2.2. Illustration of Leonardo’s drawing of the bottom side of a crossbow on Codex Trivulzianus N 2162, p. 99 [prev. f. 54r], Castello Sforzesco, Milan

3 Rather than restate the specific drawings at issue in the present study, a brief survey of some of these images may be seen among Johannes Nathan’s set of drawings in Frank Zöllner and Johanne Nathan (2003) Leonardo da Vinci, the complete paintings and drawings, Taschen, Köln, pp 616–657. See also: A. E. Popham (1946/1994), pp 161–166, 297–320.
5 Metal stylus marks are partially visible in the Zöllner Complete Paintings image of the Turin Scythed Chariots. Although photographs in Codex Atlanticus facsimiles do not show most of the metal stylus marks on these drawings, I have seen the marks in person and I mention the findings further below.