LODOVICO CIGOLI ON THE ORIGINS AND *RAGIONE* OF PAINTING*

by Martin Kemp

Dedicated to Professor Michael Jaffé to celebrate his achievements as Director of the Fitzwilliam Museum and in the establishing of History of Art at Cambridge

The very high esteem that Lodovico Cigoli enjoyed as a man of arts and letters amongst his contemporaries, including Galileo Galilei, has hardly been reflected in later writings about the crucial artistic developments in Florence and Rome during the early years of the seventeenth century. His skills as a draftsman have continued to attract attention from *cognoscenti* of Italian drawings, but his wide-ranging talents as a painter, architect and designer have not generally received the acknowledgement they deserve, particularly outside Italy. His one surviving work of theory, the *Prospettiva pratica*, to which is appended a brief tract on the *Cinque ordini*, matches in intellectual sophistication and geometrical competence any treatise by a practicing artist, yet remains unpublished. However, there have recently been encouraging signs that his *fortuna* may again be in the ascendant, both on his own account and as part of the current reappraisal of Florentine art around 1600.[1] Michael Jaffé's pioneering emphasis in 1977 upon Cigoli's importance for Rubens had already suggested that we were dealing with an artist who played a key role in the first two decades of the new century.[2] The researches of Miles Chappell, including his keenly awaited catalogue for the exhibition of Lodovico's drawings in the Uffizi in 1991, are laying the foundations for a clearer definition of the master's true stature in the formation of new stylistic ideals in Florence and Rome.[3] And an edition of the *Prospettiva* is at last in prospect.[4]

The purpose of the present essay is to make immediately available three of the *proemi* from the *Prospettiva pratica*, which deal with questions of wider interest than his technical expositions of linear perspective. The three excerpts give a clear sense of the educated voice that spoke with such authority in the debates conducted in academic circles around 1600, just as the advanced geometrical acumen of the technical sections of the treatise show us why Cigoli won the respect of Galileo — for more than his painting.[5] The transcribed and translated passages demonstrate not only that Cigoli was a master of the standard terms of humanist reference in the theory of the visual arts but also that he possessed an original turn of mind, particularly with respect to his thoughts on the origins of painting and his advocacy of technological aids for the draftsman.

His *Prospettiva pratica*, on which he was working during the last years of his life, survives in two versions. The prime (though not autograph) manuscript in the Uffizi consists of 103 folios, 189 sides of which contain written or drawn material.[6] It is illustrated with drawings in pen, a few of which are shaded with wash, and in some cases with woodcut versions of the diagrams which have been pasted into the text. The printed illustrations, attributed by Baldinucci to Sebastiano Cardi, Lodovico's brother, indicate that the treatise was being prepared for publication.[7] We know that his nephew, Giovanni Battista Cardi, who prefixed his *Vita* of the artist to the treatise, sought the privilege to publish in January 1628 (new style,

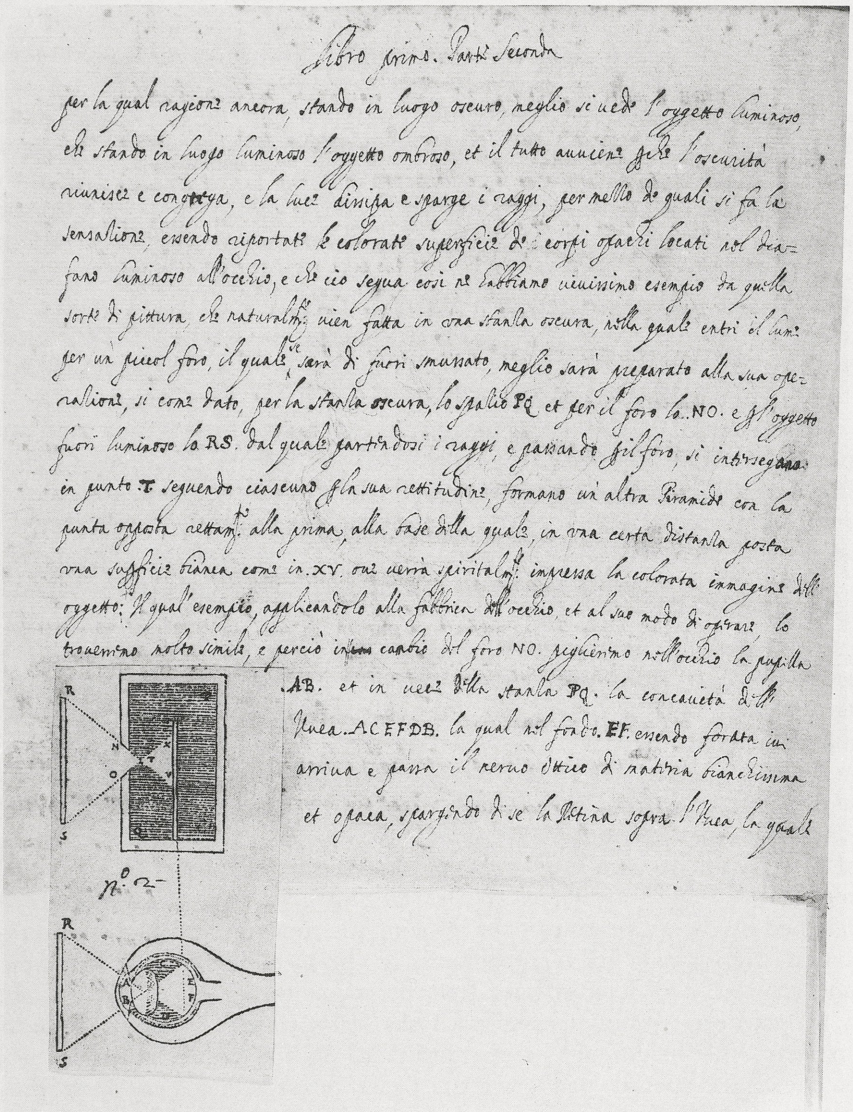
1629) and composed a dedication to Ferdinand II, Grand Duke of Tuscany.[8] The second version, transcribed by Eligio Bizelli in 1676 specifically for Galileo's leading pupil, Vincenzo Viviani, is in the Biblioteca Nazionale and claims to be "an exact copy of the original manuscript" which formerly "existed in the Library of Cardinal Francesco Maria de' Medici, and later passed to the Palatina" (eventually entering the Uffizi).[9]

G.B. Cardi's plan was unrealised and the treatise was never printed. Although the two versions are both readily accessible in public repositories, they have received scant attention in modern publications. There has been a tendency to assume that manuscripts took little part in the transmission of ideas in the era of the printed book, and, therefore, to think that unpublished treatises, such as those by Cigoli, Matteo Zaccolini and even Leonardo (before the *editio princeps* of the *Trattato* in 1651), are of strictly limited importance compared to printed texts.[10] However, there is ample evidence to show that the many manuscripts of Leonardo's *Trattato* were keenly consulted by pioneering artists in the early Baroque, and even that the less famous treatises by Zaccolini were made fully accessible by Cassiano del Pozzo. It is also clear that Cigoli's *Prospettiva* was well known within his extensive circle of admirers. His associations with Accolti, author of an important book on perspective, remain to be clarified, but it is certain the French theorist, Niceron, knew Cigoli's perspective machine, while Cinelli and Baldinucci testify to the more general reputation of the *Prospettiva*.[11] Amongst painters, Cigoli's ideas and techniques were promulgated by his immediate followers, most notably Giovanni Coccapani, who taught perspective at the Accademia del Disegno.

The early admiration for Cigoli's treatise was well founded. As a perspectivist he shows a mastery not only of the obvious sources in art theory — most notably *Le due regole* of Vignola, published in 1583 with Egnatio Danti's mathematical commentary — but also of the most advanced ideas in the new science of projective geometry.[12] His treatise is organised around three 'rules', the first two of which are broadly comparable to Vignola's. These concern, firstly, the full procedure of projection of the plan and elevation of an object to the picture plane, and, secondly, the method relying upon the so-called 'distant point' (the lateral focus of the diagonals through the foreshortened squares of the *pavimento*), which can be used to transpose any given form into the illusionary space of the picture.[13] Cigoli takes the important step of translating Vignola's distance point method into the more up-to-date technique of the *punctum concursus* as conceived by the important Urbinate mathematician, Guidobaldo del Monte. In his *Perspectivae libri sex*, published in 1600, Guidobaldo had shown how to determine the vanishing point for a line at any given orientation to the picture plane, and it is this technique that Cigoli adopts at the start of his 'second rule'.[14] Cigoli's innovatory 'third rule' concerns the use of devices, 'perspectographs' as they may be called, for the imitation of nature and for various technical achievements such as the illusionistic painting of domes and anamorphic tricks.

In addition to his careful technical expositions, Cigoli makes general remarks on the origins and intellectual rationale of painting, and provides advice for "young painters who delight in perspective". The three passages here selected for transcription and translation are drawn from the very start of the treatise, from the introduction to the first of his sets of practical instructions on the depiction of objects in perspective, and from the opening of his book on the 'third rule'.

The first of the excerpts begins with a relatively standard set of arguments about the primacy of sight — generally Aristotelian in tone —, about the role of the eye as a sensory organ and as a 'mirror' of the emotions, and about the dignity of art. In line with other theorists, including Alberti and Leonardo, he speculates on the origins of painting, but he puts forward what seems to be a novel hypothesis. He regards the working of the eye as analogous to a camera obscura (Fig. 1), and suggests that it was a desire to preserve the impermanent image in the



1 Comparison between a camera obscura and the human eye, from Lodovico Cigoli, *Prospettiva pratica*, fol. 14v.

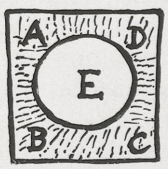
camera that led someone to invent painting.[15] Since the image in the camera is fully coloured, Cigoli believes that his explanation is preferable to the standard Plinian account of the tracing of the outline of a shadow, "since shadows only reveal the boundaries of things".[16]

His subsequent account of the visual properties which provide the foundation for painting draws upon the tradition of Aristotelian optics, as transmitted to the west by the translated writings of the Islamic philosopher Alhazen.[17] Cigoli clearly adheres to the view that colours arise from differently proportioned mixtures and lightness and darkness, and he explains that things become visible by 'contrary effects', that is to say by what we would call the 'simultaneous contrasts' of tone and colour. He uses a diagram of a light circle surrounded by a darker

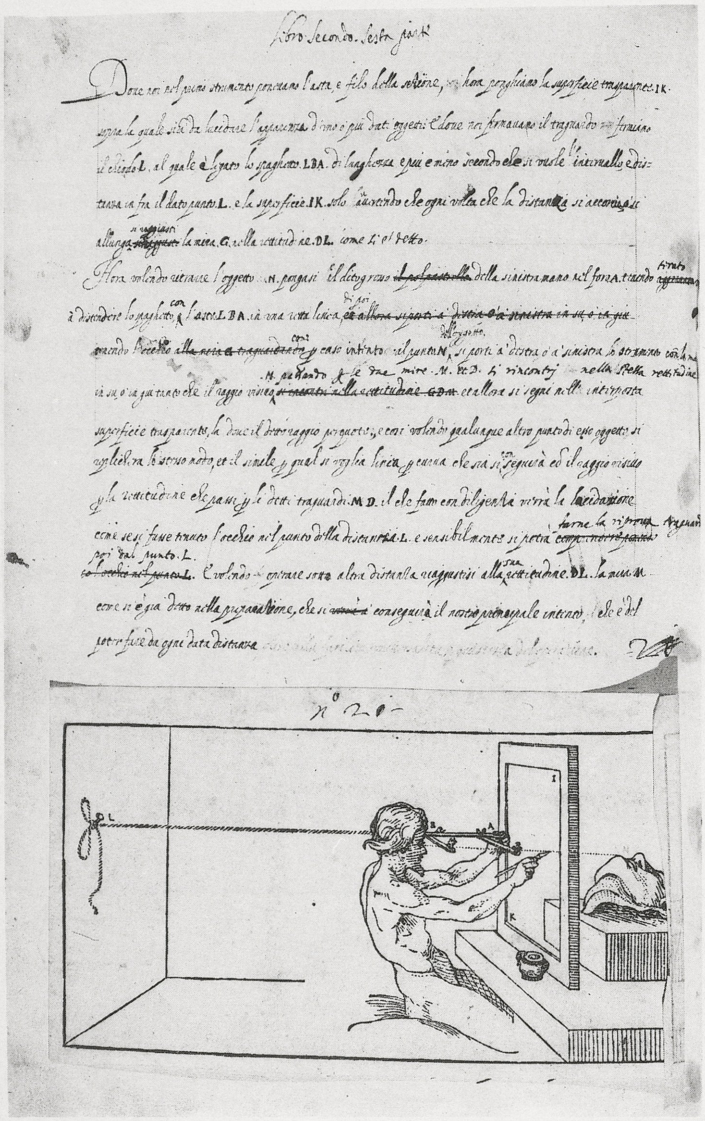
'container' to demonstrate the relationship between the degree of contrast and the force with which the objects will be apparent to the eye (Fig. 2). Such effects of simultaneous contrast had been discussed by Alhazen and his followers, including Leonardo.[18]

His promotion of perspective as an essential discipline for the artist also stands firmly in the Leonardo succession, and he specifically cites Leonardo's dictum that "a painter without perspective is like a Sailor at Sea with neither rudder nor compass".[19] The introduction to the 'first rule', the second of our excerpts, follows his basic geometrical definitions of geometrical terms and his expositions of the relationships between the plans and elevations of various solid bodies, including the lute, an object much favoured by perspectivists. In his succinct and immaculate outline of his three rules, he explains that the second relies on the '*punti detti di concorso*', a clear reference to Guidobaldo's geometrical terminology. He acknowledges that his more geometrically advanced technique "can cause beginners and less experienced painters to become confused through lack of understanding".

The third of the excerpts relates to the most innovatory section of his treatise, and advocates that young painters should be aware of the utility of perspective machines to circumvent the 'length of time and tedious effort' required to implement the geometrical rules, particularly when depicting complex objects such as the human figure. He was well acquainted with earlier devices: Alberti's and Leonardo's 'veils' and 'windows'; the machines illustrated in Dürer's "*Geometria*"; and the full range of 'perspectographs' analyzed in the Danti-Vignola treatise.[20] He also showed himself to be sharply aware of the limitations of the existing devices. Those using a veil or window were limited in their viewing distance to the length of the draftsman's arm from the translucent plane, while those which used strings or wires to replicate the path of visual rays suffered from the defect that the material lines inevitably sagged, however taut they were pulled. The contrivance he suggests to rectify the first deficiency is a version of the invention which Dürer credits to Jacob de Keyser, and uses a sighting device attached by a string to a ring or nail in the wall behind the draftsman as a way of achieving a greater apparent viewing distance from the picture plane (Figs. 3, 5).[21] The other device, to which he gives pride of place, is of his own invention, and may be regarded as the first fully automated drawing system, in that the movement of the sighting bead over the object to be depicted is precisely matched by the movement of the drawing instrument over the paper on the horizontal drawing board. He illustrates the components of the machine when disassembled, to show how it is manufactured, and demonstrates it in orthodox use (Fig. 4). He also shows how it can be used to perform various specialised tasks. Its primary function is to draw three-dimensional objects. The height of the sighting bead on the vertical member is determined by the movement of the special 'pen' over the paper towards and away from the draftsman, while the lateral transverse of the upright and the 'pen' are controlled by a string running over pulleys and operated by the draftsman's left hand. A modern version of this machine, con-



2 Diagram to illustrate vision by contrast of 'colour', based on Lodovico Cigoli, *Prospettiva pratica*, fol. 7r (ABCD - dark surround or 'container'; E - light body).



3 Draftsman using a sighting device to draw a foreshortened head on a 'window', from Lodovico Cigoli, *Prospettiva pratica*, fol. 95v.

structed by Filippo Camerota, shows that it can be operated smoothly and effectively with a certain amount of practice and skill of hand.[22] Cigoli also shows how the device can be used 'in reverse' to transfer a drawing onto a flat or curved surface on any required scale. Additionally, if the vertical elements are inclined relative to the base, an angled projection can be achieved, such as is required for anamorphic design.[23]

Cigoli's clever perspectograph achieved a reputation independently of the treatise, and a number of versions of it seem to have been in circulation. According to Baldinucci, Cigoli shared his knowledge of the uses of the 'ingenious instrument' with the painter Andrea Commodi.[24] Vincenzo Dandini also appears to have possessed a version of the device.[25] Its most

notable appearance was in the Parisian cabinet of Ludovic Hesselin, counsellor to the King of France, and it was this version that was illustrated by Jean François Niceron in 1646.[26] Its appearance in print, in what became a well-known treatise on the 'curiosities' of perspective, ensured that it would be known to later generations. As late as 1825 Sir Francis Ronalds was patenting an up-to-date variation of the Cigoli machine, testifying to the quality of the original conception.[27]

Now that Cigoli's voice is beginning to be heard again and his ingenious skills are becoming more apparent, it is to be hoped that the contribution he made to the reform of painting around 1600 can be more fully recognised. In any discussions of the formation of the Baroque style in theory and practice, of the roles of rule-based and nature-based study, and of the revival of Leonardesque ideals of imitation, Cigoli should increasingly be accorded his due place. The present publication of excerpts from his writings is designed to further this process.

4 Draftsman using Cigoli's perspectograph to draw a cube in perspective, from Lodocivo Cigoli, *Prospettiva pratica*, title-page.

Excerpts from Cigoli's *Prospettiva pratica* (fols. 6v-7r, 30r and 83r-v) in transcription and translation[28]

(Editorial symbols:
deletions are in square brackets [];
insertions are preceded by < and followed by >;
sections in the hand of the scribe of the main text are in ordinary script;
sections and additions by hand 2, the scribe of the *Vita* of the artist at the start of the Uffizi manuscript, are in *italic*.)

FOLIO 6

Libro Primo Parte prima degl'Elementi del Disegno

Proemio

L'Anima nostra chiusa nel corpo nulla sente per se medesima delle cose esteriori, se non quanto da[i] sensi li vien' riportato[29], di qui è che noi, delli strumenti loro per un certo natural' instinto, diligentemente tenghiamo cura, et in particolare alla conservazione degl'occhi piu che d'ogn' altro, siamo inclinati, si come per la nobilità del loro offizio ben par' che si convenga: Questi non à caso, con maggior artifizio d'ogn' altra parte dell'Animale, la Natura compose, e non senza ragione li dette particolar corpo, che è l'humor cristallino strumento proprio del vedere, il quale circondo di diverse parti, tutte all'opera di quello intente, quasi che da per se separatamente intendesse fabbricarlo, e questo nella concavità dell'osso per sua maggior sicurezza, come cosa piu cara, e nella fronte, luogo il piu eminente e piu degno di tutto il corpo lo situò, luogo a quello piu ch'ad [qualunq] altro sensorio convenevole, poi che servendo come per guida, rende facile ogn'operazione humana, senza questo e cosi imperfetto e manchevole l'Huomo, che restando inabile a qual si voglia esercizio, par si possa dire, che morto viva tra gl'altri[30], per mezzo di esso senz'altra scorta si indirizza a quello che le fà di bisogno, e godendo della vista di varij oggetti, ne gl'occhi imediatamente dimostra se in quelli prenda diletto, e cio perche à guisa di specchi ricevendo le specie esterne, non mancò chi specchi del cuore ancora gli nominasse, il che vien persuaso mentre si considera il consentimento che hanno con quello mediante il Cervello, strumento del quale l'Anima si serve per le sue operazioni, risedendo ella nel Quore influisce a quello la virtù di poter' operare, il quale operando, quasi necessitato comunica à gli occhi l'evento del suo effetto, i quali ricevendolo a noi lo mostrano come specchio, nel quale refletta tutto quello che nell'interno nostro riceve alterazione: Il che considerato da alcuni presero ardire di affirmare che non si po<te>ssin' cavare da altra parte maggiori ne piu certi indizi delle passioni dell'Animo quanto da gl'occhi, da[i] quali evidentemente si conosce l'Ira, la Clemenza, la Misericordia, l'Odio, l'Amore, la Tristezza, e finalmente ogn'altro affetto dell' [quale l'animo possa venir alterato:] <animo nostro:> questi ardono, splendono, tremoleggiano, ridono e si attristano, da quelli escono le lacrime della compassione, e della pietà, et alcuna volta manifesti segni d'allegrezza, per il che credettero alcuni contenersi drento à quelli l'animo, parendoli ogni volta che noi fruiamo, o possediamo, gl'occhi fruire e possedere, per mezzo di questi riceviamo, non solo delle cose vicine, ma delle lontane ancora la cognizione de gl'accidenti, come sarebbe del colore, della figura, e del numero, del moto, della posizione, e dell'intervallo:[31] le quali cose tutte senza dimora, per quanto si distende et allarga la virtù visiva di ciaschedun' riguardante (mediante tale strumento) si apprendono, da<lli> quali maravigliosi effetti si può cavare che il senso del vedere in dignità avanzi tutti gl'altri, si come ancora se si risguarda della parte dell'oggetto (che è il lume) non è egli vero che è cosa Divina?[32] e se si considera l'operazione non trapassa ella i termini di Natura? poi che spiritalmente et in uno stante la conseguono. Ma si come ne gl'altri

sensori avviene, che il motivo delle loro operazioni proceda dall'oggetto, cosi nel senso del vedere, dal quale levata d'avanti l'opposta cosa visibile, nello stesso tempo il gia formato Simulacro nell'occhio vedente s'estingue, dove che per sovvenir' tal'hora ò dilettar' altrui essendo tal' rappresentazione necessaria, ne per la detta cagione, a sua posta, conseguir potendola, ha l'Huomo con sottile investigazione

END OF FOLIO 6

ritrovata la Pittura, la quale à guisa di purissima conserva il qualificato aspetto ne ritenga, e dimostri: Questa con tutta proprietà e naturalezza far lo puo, che non solo ha havuto forza d'ingannar gl'uccelli, ma li stessi piu periti artifici ancora[33]*, questa per aiuto dell'intelletto fra gli strumenti piu atti, et accommodati fu ricevuta da gl'Egizij, i quali con la pittura d'Animali ed altri simili contrassegni figurando i Ieroglifici loro, significavono, e conservavono con quelli le richezze delle piu alte scienze. Et i Romani con figure, Archi, e Colossi superbissimi eternavano i maravigliosi fatti per eccitare gl'animi a gloriose imprese: E noi oltr'a questo per meglio volger' le menti nostre a Dio nella Chiesa Santa con le Sacre pitture procediamo, e quanto cio sia dallo stesso Dio gradito, ce ne fanno larga testimonianza i Voti dedicati a tante miracolose immagini, dove non si puo negare, che la pittura non sia mezzo efficacissimo et ancora antichissimo, poi che creato il Mondo e la luce, ella apparisce nelle chiare e quieti acque come si vede per le reflessioni de gl'Alberi, et altro, che se la rappresenti d'avanti, poi che tutto e contenuto sotto la medesima ragion' di pittura, e con altro modo piu proprio la Natura lo mostra in que luoghi serrati, dove per un piccol' foro trapassi il lume, a cui in debita distanza dentro sia opposta una superficie bianca*[34]*, in essa tutti i Simulacri che di fuori gli saranno opposti verranno dipinti (Fig. 1), e di tanto piu vivace colore quanto da maggior' lume saranno percossi, ma perche tolto via tal mezzo se ne fuggono, e spariscono, perciò mi credo in mente altrui cadesse, per ritenerli, andar con colori sopra tal superficie secondando e lineando, e dipingendo tali apparenze, il che ha piu del verosimile di quello, che da Plinio vien referto*[35]*, sopra le ombre e sbattimenti de corpi, poi che l'ombra i termini estremi solo dimostra, e questa non solo gl'estremi ma le parti di mezzo, con ogni maggior proprietà, che in artifiziosa pittura si possa desiderare, dalli quali esempi, o qualunque altra cagione di suo principio, continuato l'uso di essa per lunga esperienza si è fatta una cognizione prodotta da molte osservazioni, la quale al fine è divenuta arte nobilissima, et hora come arte procede con retta ragione nelle cose che si hanno da fare, e con tanto piacevol' condimento di diletto và addolcendo l'amarezza della disciplina, che a ragione d'ogni studiosa fatica vien giudicata meritevole, si come chiara testimonanza se ne trae da i savi Greci, i quali in tanto pregio l'hebbero, che fra le prime arti liberali l'annoverarono, e come necessaria disciplina al buono ammaestramento de nobili giovani l'ordinarono, e questo non con avaro fine, ma perche pervenuti che fossero alla matura età, con piu chiareza, e maggior intelligenza potessero contemplare le bellezze della Natura e con diletto riceverle*[36]*, dal quale fino dalla fanciulezza tirato, hora che arrivato sono alla cognizione di essa, quello che per caso facevo, per propria elezione con ogni studio forzato mi sono di apparare, e per meglio apprenderla, et appresa conservarlami ho eletto come piu sicuro modo lo scriver' ogni precetto, et avvertimento che dalla viva voce, e da gli scritti altrui caverò, ò che da me stesso andrò ritrovando con quel piu semplice, e breve ordine che da me si potrà, et intendendo solo esplicare il concetto, e trattar con pittori, piu tosto con voci significanti, e termini pittoreschi andro dimostrando la materia, che con lingua tersa et esquisitezza di parlare.*

Considerando dunque, che il sensibile piu potente ha maggior' forza di muovere il senso, e dato in soverchia potenza lo distrugge, il senso del vedere ha per proprio oggetto il colore, del quale i termini estremi sono il bianco, et il nero, la soverchia bianchezza desgrega e disperde la vista,

END OF SIDE

e per il contrario la grand'oscurità i raggi visivi restringe e condensa talmente che priva lo strumento della sua operazione:[37] *Da questi dua contrari procedono le differenze del colore, per mezzo del quale si distingue il contenuto dal contenente, si come per esempio nella superficie ABCD descritto il cerchio E (Fig. 2) sarà esso il contenuto, e la data superficie AC il contenente, la qual figura E, quanto sarà di piu diverso colore al suo contenente, tanto piu si farà manifesta all'occhio, come se il cerchio E sarà piu bianco, et il contenente AC piu nero, con maggior forza si rappresenterà all'occhio, e per il contrario con minore quanto sarà di piu simil colore al suo contenente, il che dato in estremo grado similissimo non piu si distinguerà per cosa separata:*[38] *Per lo che considerando il Pittore, come ciascun'oggetto si faccia visibile per mezzo del lume, e del'ombra sotto specie di colore, e che mediante l'accostamento e toccamento di dua diversi, ò contrari si fa nota la linea, perciò giudica di poter con material colore arrivare all'immitazione di qualcuna data apparenza visibile, circonscrivendo con la linea la forma, e quantità dell'oggetto, facendolo per mezzo del colore qualificato, et apparente: Il che di non piccola maraviglia è considerare che con linee e colori proporzionali locate sopra a piana curva, o mista superficie, con tanta proprietà e naturalezza da un determinato punto, ad elezione dell'operante, si possa in essa dimostrare non solo la grossezza, il rilievo et il colore de i corpi, ma la posizione ancora, il moto, l'intervallo, e gl'affetti e passioni dell'animo, e tutto procede dalla ben distribuita quantità di linee e colori proporzionali, li quali noi significhiamo sotto nome di disegno, d'onde ne procede la perfetta immitazione della pittura, la qual si divide in tre specie, una delle cose, che furono o sono, l'altra di quelle si dice [che siano] ò par che siano, l'ultima di quella sorte come elle doverrebbono essere*[39]*, per cio la perfetta operazione di essa non solo ricerca la cognizione della Geometria, Prospettiva, Architettura, Poesia et altro simile, ma l'intelligenza buona ancora delle cose naturali e d'alcuni principij universali*[40]*, alli quali volendo arrivare ci fa di mestieri proceder' con termini certi, parte attenenti alla quantità e parte alla qualità e questi sono il Punto, la Linea, la Superficie et il Corpo:*[41] *il Colore, il Diafano et il Lume, i quali, per esser propri mezzi per condursi operando al nostro fine ci sarà lecito al presente esplicare, secondo che il natural' atto della pittura [ne] richiede.*

END OF FOLIO 7

FOLIO 30

Prima regola di prospettiva

(Proemio)

Hora che per mezzo della pianta et del proffilo [noi] possiamo venire in cognizione della figura, forma e positura di qual si voglia oggetto visibile, passeremo a[i] particolari e propri termini della pittura, atteso che [(come dice Lionardo Vinci ne[i] suoj scritti)] il pittore senza prospettiva sia come Nocchiero in Mare senza timone, o bussola, che non sa gia maj dove si sia, ò dove si vadia[42], e[t] la ragione à me par questa, [che] volendo [il pittore] egli con semplici linee, e[t] colori locati sopra piana, curva ò sinuosa superficie ritrarre, et rappresentare qualunque apparenza di qual si voglia oggetto visibile, ne essendo la superficie capace, delle [tre] dimensioni aspettanti al corpo d'altre che di due, è percio necessario <fingere con l'Arte> quella, della quale ella si trova incapace; [et manchevole à suplire con l'arte]: et à questo usa quell'ottimo remedio che dall'[o] avvertito vedere fu chiamato prospettiva, <*essendo*> il semplice aspetto operazione di natura, et il prospetto officio di ragione[43], dalla qual' ragion' prospettiva guidato il pittore procede con l'atto pratico <di essa>, nel quale per camminare con chiarezza, avanti ad esso dobbiamo stabilire tre termini, il primo è il proffile et la pianta di tutto quello che si vuole ritrarre; il secondo è la superficie sopra la quale si ha da ritrarre; il terzo, è luogo dove <ha> star l'occhio a vedere, altrimenti senza fondamento, e[t] base haremo fabbricato l'atto pratico prospettivo, <*del quale si mostrerann*>o tre regole, la prima [perche] mi pare

piu chiara per l'introduzione e per rendere altrui capace che cosa sia la sezione, e segamento de raggi visivi, nella q<ua>le la pittura prende sua ragione[44], e quando ci parrà <*di haver fatte*> bastevoli dimostrazioni, si per chiarezza del bene intendere, come ancora per tal volta servirsene, passeremo alla seconda [regola], la quale perche procede per via di certi punti detti di concorso (de[i] quali si dirà à suo luogo) percio è piu breve, e piu atta all'[a] operazione, ma occulta <*ha*> al quanto piu la sua ragione[45], <*perlo che*> [onde] i principianti et i poco periti in questa per la debole intelligenza facilmente si confondono, dando la colpa del loro errore bene spesso alle regole, <*le quali sono certe, e reali*:> dalla qual[e] seconda regola trapasseremo alla terza, che opera per via di traguardi con cordicelle ò spaghetti, con la quale, [à] chi bene intende le due prime, non solo procede con facilità, [e chiarezza], ma qualunque regola <o> strumento <che> li venga [poi] per le mani facilmente

END OF FOLIO 30

FOLIO 83

Libro Secondo Sesta parte. Descrizione de gli strumenti

A giovani pittori che si dilettano della Prospettiva

<*Doppo l'esermi esercitato nella prospettiva con le solite regole di linee, l'esperienza*> al fine ne ha fatto sorgere, che queste sole al bisogno di noi altri pittori non sia<no> bastevoli, ma che *d' altro* <oltre a quello che le regole> <possono> ci faccia <*di*> mestiero, come per esempio, <*volendo*> una veduta di strade con varij <*ornamenti di*> Palazzi Paesi <*od'*> altra composizione di cose differenti à diverse inclinazioni situate, le quali per le solite regole di linee non si possono perfettamente esplicare senza la cognizione di lor pianta [e] proffilo, luogo e propria lor positura, nel locar delle quali piante, <*si come*> anco nel porle in prospettiva, sa chi ha provato quante difficultà ci <*si*> opponghino, come maggiori ancora nel rappresentare un corpo humano, il quale tra [i] piu difficili essendo difficilissimo, tanto piu de gl'altri è necessario, e non diremo la difficoltà, la lunghezza del tempo e la tediosa fatica, che tali regole ingombrano et astringono per venire alla conclusione dell'opera nostra, ad abbandonare ogni regola, et ad'operare <*come si dice,*> <à oc>chio, et à caso, la qualcosa scema molto di dignità alla tanto nobil'arte della pittura: [et tutto mi credo] <*se bene so che*> [proceda dal essere] tali regole di linee <*sono*> piu atte ad illuminare i principianti nel ben' <*intendere*> la prospettiva, che per piu facilmente operare col me<z>zo di esse in pittura <*non mancando il modo per conseguire il tutto*>. Il che considerato forse da Alberto Durero nel fine della sua Geometria doppo alle due dimostrate regole di prospettiva per linee, descrive alcuni strumenti quasi dir volesse, quelli esser me<z>zi piu proporzionati, et atti all'operazione, et alla conseguzione del nostro bisogno; de' quali l'uno con l'intersegazione di dua fili và segando i raggi visivi, che riguardono i termini delle cose vedute, e di punto in punto li riporta nello sportello[46], l'altra opera per lucidazione da farsi sopra un velo, vetro o altra trasparente superficie[47], si come anco Lionardo Vinci ne suoi scritti dimostra, e come frate Ignazio Danti replica nel comento fatto sopra la prospettiva del Vigniuola, con alcuni altri strumenti che da diversi ha raccolti, come la cava superficie del me<z>zo Cilindro di Baldassarri, la squadra che egli stesso dice haver mostrata in Firenze, et altri[48], i quali ben che sieno di agumento, et in particolare quelli d'Alberto non sono però bastevoli al nostro bisogno <*perciò che quello che opera*> per lucidazione non fà il segamento de i raggi da ogni data distanza, e se [Alberto] per farlo usa Alberto allo sportello, e frate Ignazio alla squadra, [seguita da altri moderni] in vece del raggio visivo, un filo, che vadi à toccare ci<a>scun' punto dell'oggetto,

END OF FOLIO 83

Libro Secondo. Sesta parte.

che si hà di ritrarre <*tutta via molte volte*> riuscirà l'operazione falsa e la ragione è questa, che il raggio visivo sciolto dalla materia si distende naturalmente per retta linea, ma il filo per esser corporeo e grave, è di natura pieghevole sostentato solo ne gl'estremi se bene <*sia*> tirato si curva nel mezzo, e piu e meno secondo che piu, e meno ha da prolungarsi per toccare i termini delle cose vedute, e di queste infinite essendone, alle quali non si puo accostare per toccarle, infinite ne restono che per conseguenza, che <*con quelle*> ritrarre non si possono: Dalle quali difficoltà spinto ho pensato a i due seguenti <*strumenti*> ne quali in vece del filo ci serviremo del proprio raggio visivo, il quale senza servitù di chi lo porti giugne in uno stante a qual si voglia dato oggetto, e quello và toccando in ogni sua parte secondo che si vede, e che si vuole, e subito con lo strumento si fà la sezione, e segamento di ciascun raggio visivo. E di questi dua [strumenti], l'uno di punto in punto e [segamento] proporzionatamente riporta i termini dell'oggetto davanti all'operante (Fig. 3), e l'altro opera per lucidazione (Fig. 4), et ambi da ogni data distanza con maggior brevità universalità e facilità di questi io ne habbia veduti, ne con minor' avanzo vincono ancora le consuete regole lineari, poi che <*per mezzo di quelli nelle cose non vedute*> [non solo] si puo operare con le solite piante e proffili, come operano quelle, <*per far ciò*> bastan' loro le prime semplici piante per disegnare ancora in qual si voglia pendenza, ma nel ritrarre le cose vere e presenti, supera<no> quelle incomparabilmente, poi che non gli ga di mestiero, ne di pianta ne di proffilo, ma immediatamente opera<n>o con grandissima facilità e forse con maggior giustezza, poiche a quelle è piu che à questi necessario il trasportar delle misure, nel che sempre si du[p]plica il pericolo dell'errore, come si fa noto a chi si esercita in esse, oltre a cio l' <*operazione fatte*> [cose operate] si possono ridurre di piccolo in grande non come descrive Lion Batista Alberti per <*mezzo*> di un partimento di quadri detta vulgarmente la rete, ma di punto in punto in qual si voglia sorte di superficie piana, concava, colma, ò <sinuosa> come appresso dimostreremo[49], <*si*> come quelle ancora delle reflessioni dell'acque e delli spe<c>chi, et altre, le quali cose per i modi soliti sono difficilissime, e lunghissime a conseguirsi, il che e molto contrario al nostro bisogno; <*e per parermi*> tali invenzioni (se la propria affezione non mi inganna) non solo di aiuto, facilità, e chiarezza all'opera<*nte*>, ma grandemente diverse dall'altre, dalla qual varietà, e novità spesse volte sono svegliate le menti altrui a nuove, e piu comodi invenzioni, ò à quelle facilitare, per ciò mi sono risoluto darli in luce.

END OF SIDE

Book one, Part One: Of the Elements of Drawing

Proem

Our Soul, closed within our body, can know nothing of the world outside except what our senses relay to it;[29] for this reason, through a certain natural instinct, we take great care of our sensory instruments, and are particularly inclined to the conservation of our eyes, more than of the others, as befits the nobility of their function. Not by chance did Nature use greater artifice in their formation than in that of any other part of the Animal, and not without reason did she give them a particular body, the crystalline humour, which is the proper instrument of sight, which she surrounded with various parts, all designed to perform that operation, almost as though she were forming the organ for its own sake; and she situated them in a hollow in the skull, for greater security, as the most precious of all parts; and placed them in the forehead, the most worthy and eminent place in all the body, and more fitting to them than to any other sensory organ.

Since sight serves as a guide, it facilitates every human activity, and without sight, a man is so imperfect and wanting, and so incapable of performing any task, that one could almost say that he lives among others as a dead man.[30] Guided only by sight, a man seeks out that which is good for him, and seeing various objects, one can immediately see in his eyes whether he takes pleasure in them; and since his eyes act in the manner of mirrors, receiving the external images, some people have even called them the mirrors of the heart, persuaded by the idea that they communicate with the heart by means of the brain, the instrument used by the Soul for its operations, for the soul resides in the heart and gives it the power to function, and when it functions, almost of necessity it communicates to the eyes the outcome of its effect, and these having received it, show it to us as a mirror, in which is reflected all that is altered within us. Considering all this, some made so bold as to affirm that the greatest and most certain indications of the passions of the Soul could be seen from our eyes, rather than from any other part of the body. For in them Anger, Clemency, Mercy, Hatred, Love, Sorrow and in short every other affection of our mind can be clearly recognised. Our eyes burn, shine, tremble, smile, and become sad, from them issue tears of compassion, and of pity, and sometimes clear signs of happiness; therefore some people believed that the mind was contained within them, thinking that every time we enjoy or possess something, our eyes enjoy and possess them. Through our eyes we signal that we recognise, not only in things close by, but even in those far away, the accidents, such as colour, shape and number, movement, position, and interval[31]; all these things which have no permanent location, are perceived, as far as the visual power of each spectator allows; from these marvellous effects one can deduce that the sense of sight is more dignified than all the others.

Furthermore, if one examines the object of sight (which is light), is it not truly a Divine thing?[32] And if one considers its operation, does it not transcend the limits of Nature? For its effects are granted to us immaterially and instantly. But as with the other senses, whose operations are activated by an object, thus it is with sight: the instant the visible thing is removed from view, the image which has been formed in the eye vanishes. Hence, when a representation of such a thing was necessary in order to remember the image or to please others — and for the afore-mentioned reason the image was not present in that place — Man with subtle investigation invented Painting, as the purest way to retain and show the desired sight. This it can do with all propriety and naturalness, for not only has it been able to deceive the birds, but even the most expert craftsmen.[33]

The Egyptians regarded painting as among the most apt and suitable instruments to aid the intellect; they used pictures of Animals and similar signs in the Hieroglyphics, to convey meaning, and with these they conserved the riches of the highest sciences. And the Romans celebrated their most glorious feats with figures, Arches, and the most superb Colossi, in order to incite people to glorious undertakings. And we continue the process in our Holy Church with Sacred paintings, the better to raise our minds to God; and the Vows dedicated to so many miraculous images bear ample witness to the fact that this is pleasing to God Himself.

And it cannot be denied that painting is a most effective and most ancient tool, since as soon as the world and light had been created, it appeared in the clear and quiet waters, as we can see in the reflections of Trees and other things which are represented there, for all this is included within the scope of painting. And Nature shows us this in a more proper manner in those enclosed places, where light enters through a small aperture, opposite which at the appropriate distance is a white surface[34]; on this, the images of all the objects placed outside will be depicted (Fig. 1), and the more light strikes them, the more vividly coloured they will be. But since they flee and disappear as soon as that surface is removed, I believe that somebody thought of preserving them by going over the surface with colours, drawing the outline of the images, and filling them in. This notion seems more probable than the one referred to us by Pliny concerning the shadows and shapes of bodies, since shadows only reveal the boundaries of things, whereas this method reveals not only the edges but also the middle areas, with all the greatest properties that one can desire in the artifice of painting.[35]

From these instances, or whatever else caused its beginning, its continued practice over a long period formed a body of knowledge, the fruit of many observations, which eventually became a most noble art, and now as an art it proceeds with true reason in the things it has to do, while sweetening the bitterness of discipline with the very pleasant condiment of delight, so that it is judged worthy of every effort of study. Of this we have clear testimony from the wise Greeks, who held it in such high esteem that they numbered it among the greatest liberal arts, and regarded it as a necessary discipline in the good teaching of young nobles, not with mercenary aims, but so that once they had reached maturity, they should be able to contemplate the beauties of Nature with greater clarity and intelligence, and delight in them.[36]

And I, attracted since childhood by this pleasure, having acquired a knowledge of it, now consciously make every effort to study and learn instead of proceeding at random; and in order to learn better, and as the surest way to retain what I have learned, I have decided to write down every precept and warning which I have extracted from the sayings and writings of others, or which I myself have discovered, in the simplest and most brief manner possible. And since I intend only to explain concepts, and deal with painters, I shall express these matters with meaningful words and technical terms rather than with a polished and exquisite style.

We know that the stronger the object sensed the more it moves the sense, and, if received in too great a strength it will destroy it. Therefore, the sense of sight having colour as its proper object, and the extremes of colour being white and black, too much white will scatter and disperse sight, while on the contrary, great darkness will restrict and condense the rays of light so much as to impede the healthy functioning of the instrument of sight.[37] These two contrary effects produce the differences in colour, by which we can distinguish the contents from the container. For example, let us take a surface ABCD on which is described a circle E (Fig. 2), the latter being the content and the former the container; the said figure E will be more clearly visible to the eye the more different in colour it is from its container, so that the whiter the circle and the blacker the container, the greater the force with which it shall be represented to the eye; and on the contrary, the smaller the difference in colour, the smaller the force; and if they are extremely similar, the circle will no longer be distinguished as

separate at all.[38] Taking into account that each object is made visible by means of light and shadow, through the image of colour, and that the proximity and contact between two different or contrasting colours make the outline clear, the Painter therefore believes that with material colours he can imitate any visible thing, by enclosing its form with a line, and qualifying and making it apparent with colour.

It is no small marvel to consider that with appropriate lines and colours placed upon a flat, curved or compound surface, not only can the size, relief and colour of objects so properly and naturally be shown, as they are seen from a certain place chosen by the artist, but even their position, movement, and interval, and the affections and passions of the mind, and that all this should proceed from the correct distribution of a number of appropriate lines and colour, which we call drawing.

From this flows the perfect imitation of painting, which can be divided into three types: one of things which were or are; the next of those which are said to be or seem to be; the last of things as they ought to be.[39] So, the perfect execution of the art requires not only a knowledge of Geometry, Perspective, Architecture, Poetry and other similar matters, but also a good understanding of the natural world and of certain universal principles.[40] And wishing to arrive at this understanding, it is necessary to explain certain terms, some of which refer to quantity and some to quality, and these are the Point, the Line, the Surface, and the Body.[41] Also, it will be appropriate to explain Colour, Transparency and Light, which are the proper means by which to reach our goal in practice, according to the requirements of the natural act of painting.

First Rule of Perspective

Preamble

Now that we are able to define the outline, shape and position of any visible object by means of its plan and elevation, we shall pass on to the particular and proper terms of painting.

A painter without perspective is (as Leonardo Vinci says in his writings) like a Sailor at Sea with neither rudder nor compass, never knowing where he is or where he is going.[42] The reason seems to me to be this: the painter wishes, merely by placing lines and colours onto a flat, curved or undulating surface, to represent the appearance of some visible object; however, the surface consists only of two dimensions, whereas the object has three; therefore it is necessary to counterfeit through Art the dimension which is missing. For this purpose he uses that excellent device which we call perspective, the simple aspect being the work of nature, while the prospect is the work of reason.[43]

Guided by reason, the painter will proceed to put perspective into practice, and in order to go forward clearly, we must establish three parameters: firstly, the elevation and plan of all that he wishes to portray; secondly, the [position of the] surface onto which he intends to paint; and thirdly, the position from which he views the scene. Without these, we should have no foundation or base for the practical application of perspective.

I intend to demonstrate three rules of practical perspective. In order to give the clearest introduction and assistance to my readers, I shall start by illustrating the section and segment of visible rays, on which the logic of painting is founded.[44] When I feel I have shown enough examples to ensure a good, clear understanding of this rule, such that it can be put into practice, I shall go on to the second rule, which, because it deals with so-called points of concurrence (as I shall explain in due course), is quicker and more apt for practical purposes, but whose theory is harder to follow.[45] This can cause beginners and less experienced painters to

become confused through lack of understanding, sometimes leading them to blame their mistakes on the rules, which however are real and certain. From this second rule we shall proceed to the third, which operates by means of sighting with strings or cords; and provided the first two rules are well understood, this one enables a painter to proceed with ease and clarity, and to understand and put into practice any other rule or instrument he may come across.

Book II. Part VI. Description of the instruments
To young painters who delight in Perspective

Having become well-versed in the practice of perspective using the normal rules based on lines, experience finally showed me that these alone are not enough to fulfill our needs as painters, but that we require more than these rules can provide.

For example, we might wish to depict a view of streets with a variety of buildings, or a landscape, or other such compositions containing different things set at various inclinations, which cannot perfectly be represented using the normal rules unless we know their plans and elevations, and their particular positions and locations. Anybody who has tried will know how many difficulties arise in drawing these plans, and in putting them into perspective; as for the human body, it is the most difficult of all, and yet it is more necessary than anything else. I shall not mention the difficulty, the length of time and the tedious effort which these cumbersome rules entail; and in our attempt to complete our work we are often forced to abandon every rule and work as we say 'by eye' and randomly — a practice which does not befit the dignity of the noble art of painting. I believe this proves that these rules are more useful in helping beginners to understand perspective, than as tools with which to paint, given that the means exist by which we can depict everything.

Perhaps this consideration led Alberto Durero, at the end of his "*Geometria*", after he had demonstrated the two rules of linear perspective, to describe certain instruments, as if to say that these were more apt and practical in their operation and better fulfilled our requirements. One of these instruments works by two intersecting wires which cut the visual rays which render the edges of the objects visible. The intersections are brought point by point into a window.[46] The other works by projecting light onto a veil, glass or other transparent surface.[47] Leonardo da Vinci also mentions similar instruments in his writings, and brother Ignazio Danti, in his commentary on Vigniuola's work on Perspective, writes of several other instruments which he has collected from various people, for example Baldassari's semicylindrical concave surface, the square which he claims he himself demonstrated in Florence, and others.[48]

These instruments, although useful, particularly Alberto's, are not however sufficient for our needs. For the one which operates by the projection of light cannot cut the rays from every given [viewing] distance; and using Alberto's window, or brother Ignazio's square (as other contemporaries have done) substituting for the visible rays a wire which touches every point of the object to be portrayed, the operation will often be inaccurate. The reason is this: the visible ray, having no mass, naturally travels in a straight line, whereas the wire, being material and therefore heavy, and by nature flexible, and being fixed only at each end, even when pulled taut will curve in the middle. The extent of the curvature will vary according to the distance it has to stretch to touch the edges of the objects on view. And as there are an infinite number of objects which it cannot touch, there will be an infinite number of occasions when it cannot be used.

Spurred by these difficulties, I invented the following two instruments, which instead of using a wire, make use of the visible rays themselves, which reach any given object in an in-

stant, regardless of who is using the instruments, and touch every part of the object which can be seen and which we wish to portray, and the section and segment of every visible ray can be done directly with the instrument. Of these two instruments, one works by bringing the outline of the object into view point by point and in proportion (Fig. 3); the other works by illumination (Fig. 4).

I have not seen any other instrument which works more quickly, more easily or more universally, and more convincingly supercedes the usual linear rules, than either of these two. For, as with the rules, these instruments allow one to portray objects which are unseen, with the usual plans and elevations — all one needs is the simplest elementary plans to be able to draw at any angle whatsoever; but in portraying objects which are really present, the instruments are incomparably better than the rules, as they rely neither on plan nor elevation, but work directly with supreme ease and perhaps with greater accuracy, for the rules demand a greater necessity for taking measurements, which always carries a risk of error, as anyone who has undertaken the exercise will know. Furthermore, it is possible to enlarge drawings thus done, not as described by Lion Batista Alberti by means of squares, commonly known as the 'net', but point by point onto any type of surface, be it flat, concave, convex or undulating, as we shall in due course demonstrate.[49] It is also possible to portray reflections in water, mirrors and the like, which by the usual methods are extremely difficult and time-consuming, contrary to our requirements.

And as it seems to me (unless my bias deceives me) that these inventions are not only helpful, easy and clear to the user, but also quite different from the others, and knowing that something new and different can often inspire the minds of others to invent yet more convenient instruments, or to refine the existing ones, I decided to bring them to light.

NOTES

The notes from 29 to 49 refer both to the Italian text and to the corresponding English translation.

** I gratefully acknowledge the assistance of Mara Thorne, who undertook the transcription, collation and draft translation of the excerpts from the treatise.*

[1] See particularly the exhibition catalogue, Il Seicento Fiorentino. Arte a Firenze da Ferdinando I a Cosimo VI, 3 vols., Palazzo Strozzi, Florence 1986-1987. Cigoli has been the subject of a recent monograph by *F. Faranda*, Ludovico Cardi detto il Cigoli, Rome 1986. See also *A. Matteoli*, Ludovico Cardi-Cigoli, pittore e architetto, Pisa 1980; *M. Bucci, A. Forlani* et al., Mostra del Cigoli, San Miniato 1959; and *K. Busse*, Manierismus und Barockstil. Lodovico Cigoli, Leipzig 1911.

[2] *M. Jaffé*, Rubens in Italy, Oxford/New York 1977, pp. 51-52.

[3] See particularly *M. Chappell*, Biographies of Cigoli, in: Diz. Biogr., vol. XIX, pp. 771-776, and cat. Il Seicento Fiorentino (n. 1), vol. III, pp. 55-58 (and vol. I, pp. 110-116); *M. Chappell* and *W. Chandler Kirwin*, The Decoration of the "Navi Piccole" in San Pietro, in: Storia dell'arte, XXI, 1974, pp. 119-170; *M. Chappell*, Cigoli, Galileo and Invidia, in: Art Bull., LVII, 1975, pp. 91-98; *id.*, entries on Cigoli et al. in: cat. Disegni toscani a Roma, Gabinetto Disegni e Stampe degli Uffizi, Florence 1979, 109-183; *id.*, Missing Pictures by Lodovico Cigoli: Some Problematical Works and Some Proposals in Preparation for a Catalogue, in: Paragone, XXXII, 1981, pp. 54-104; and the forthcoming catalogue of Cigoli drawings in the Uffizi.

[4] An edition is being planned by M. Chappell, F. Camerota and M. Kemp (Cambridge University Press). *Camerota* has written his doctoral thesis on the Prospettiva: Dalla finestra allo specchio: la "Prospettiva pratica" di Ludovico Cigoli alle origini di una nuova concezione spaziale, Facoltà di Architettura, Università degli Studi di Firenze, 1985-1986.

[5] The surviving half of Cigoli's correspondence with Galileo is published by *A. Matteoli*, Macchie di sole e pittura. Carteggio L. Cigoli-G. Galilei, in: Boll. della Accademia degli Euteleti, XXXII, San Miniato 1959. See also *Chappell* 1975 (n. 3); and *M. Kemp*, The Science of Art. Optical Themes in Western Art from Brunelleschi to Seurat, London/New Haven 1990, pp. 93-98.

[6] Gabinetto Disegni e Stampe, Codice 2660A.

[7] *F. Baldinucci, Notizie dei professori del disegno da Cimabue in qua*, vol. V, Florence 1702, p. 43.

[8] G.B. Cardi's Vita occupies fols. 1-5 of the Uffizi codex. It was first printed by *Busse* (n. 1). The letter of dedication is on the verso of the title-page of the codex, and the *imprimatur* is on fol. 101v. It is likely that Giovanni Battista was responsible for the compilation of 2660A, including the copying of the text from Cigoli's (lost) original.

[9] Biblioteca Nazionale, MS. Gal. 107, *indice*. For the subsequent histories of the Palatina version, before it entered the Uffizi, and the Bizelli copy, see *Camerota* (n. 4), pp. 17-28. The copy is generally accurate and clarifies some difficult passages in the original.

[10] For the Zaccolini MSS., see *J.C. Bell*, Colour and Theory in Seicento Art. Zaccolini's "Prospettiva del Colore" and the Heritage of Leonardo, Ph. D. thesis, Brown University 1983; and *id.*, Cassiano del Pozzo's Copy of the Zaccolini Manuscripts, in: Warburg Journal, LI, 1988, pp. 103-125. For MSS. of Leonardo's *Trattato*, see *K. Steinitz*, Leonardo's Trattato della Pittura, Treatise on Painting. A Bibliography of the Printed Editions, Copenhagen 1958; *C. Pedretti*, Leonardo on Painting. A Lost Book (Libro A), London 1965, pp. 252-259, and Commentary on The Literary Works of Leonardo da Vinci (ed. *J.P. Richter*), 2 vols., Oxford 1977, vol. I, pp. 12-47.

[11] *P. Accolti, Lo Inganno de gl' occhi, prospettiva pratica,* Florence 1625 (Accolti is mentioned by Cigoli in a letter to Galileo, 1 July 1611, published in *Matteoli* [n. 5], pp. 29-30). *J.F. Niceron, Thaumaturgus opticus*, Paris 1646, p. 191. For G. Cinelli, see *Bocchi-Cinelli*, p. 579. Also *Baldinucci* (n. 7).

[12] *Egnatio Danti, Le due regole della prospettiva pratica di M. Iacomo Barozzi da Vignola*, Rome 1583.

[13] *Kemp* (n. 5), pp. 81-82.

[14] *Guidobaldo del Monte, Perspectivae libri sex*, Pesaro 1600. See *Kemp* (n. 5), pp. 89-90 and 97 (illustrating Cigoli's fol. 41r).

[15] Compare Leonardo's illustration of a camera obscura as analogous to the eye in MS. D 8r; see. *M. Kemp*, Leonardo and the Visual Pyramid, in: Warburg Journal, XL, 1977, p. 142.

[16] For Pliny (and Alberti), see below, n. 36.

[17] For this tradition generally, see *D. Lindberg*, Theories of Vision from Al-Kindi to Kepler, Chicago 1986; and for Alhazen, see *A. Sabra*, The Optics of Ibn Al-Haytham (Studies of the Warburg Institute, 40), 2 vols., London 1989.

[18] See below n. 38.

[19] See below n. 42.

[20] *L.B. Alberti*, "On Painting" and "On Sculpture" (trs. *C. Grayson*), ed. *M. Kemp*, Harmondsworth 1991, § 31; *Leonardo*, CA 1ra, and MS. BN 2038 24r (Codex Urbinas, 41r-v) in *Kemp* (n. 5), p. 171. *A. Dürer, Underweysung der Messung*, 1st. ed. Nuremberg 1525, and 2nd. ed. Nuremberg 1538; and the Latin trs. to which Cigoli probably refers, *Institutionum geometricarum libri quatuor*, Paris 1532 (and subsequent eds.). And *Danti* (n. 12), pp. 56 ff.

[21] *Kemp* (n. 5), pp. 172-173.

[22] Camerota's reconstruction is illustrated in his thesis (s. n. 4), pp. 374-377. I am grateful to him for showing me his beautifully crafted version.

[23] *F. Camerota*, L'architettura curiosa; anamorfosi e meccanismi prospettici per la ricerca dello spazio obliquo, in: Architettura e prospettiva tra inediti e rari (Saggi e documenti di storia dell'architettura, XI), Florence 1987, pp. 79-111.

[24] *Baldinucci* (n. 7), p. 260 (in 'Notizie su Andrea Commodi').

[25] *G. Targioni Tozzetti*, Notizie degli aggrandimenti delle scienze fisiche accaduti in Toscana nel corso di anni LX del secolo XVII, Florence 1780, pp. 334-335.

[26] *Niceron* (n. 11).

[27] *F. Ronalds*, Mechanical Perspective, or Description and Uses of an Instrument for Sketching from Nature, 2nd. ed., London 1838. See *Kemp* (n. 5), pp. 187-188.

[28] The transcription of the Uffizi MS. and the translation of the three excerpts were undertaken under my editorial guidance by Mara Thorne, checking readings against the Biblioteca Nazionale MS. I am most grateful to Mrs. Thorne for her skillful work.

[29] This statement is an echo of a common view within the Aristotelian tradition, and derives generally from discussions of *De Anima*, e.g. in *Thomas Aquinas's Quaestiones de anima.*

[30] Cigoli's assertion of the primacy of sight conforms to the tradition deriving from the opening of *Aristotle's* Metaphysics. Compare *Leonardo*, Codex Urbinas, 7r-v, 13r, 15r-v etc., in: Leonardo on Painting, ed. *M.*

Kemp (trs. *M. Kemp* and *M. Walker*), New Haven/London 1989, pp. 21-22. See *D. Summers*, The Judgement of Sense, Cambridge 1987, pp. 32-39, for the primacy of sight.

[31] The so-called 'common sensibles', perceived by more than one sense, as defined by *Aristotle, De Anima*, II, 6 (though colour was a 'particular sensible' for Aristotle), and widely reworked in the Aristotelian tradition (e.g. by *Leonardo*, Codex Urbinas, 160v, Leonardo on Painting [n. 30]) p. 16, no. 18).

[32] Compare *J. Pecham, Perspectiva communis*, preface, in: John Pecham and the Science of Optics, ed. *D. Lindberg*, Madison, Wis. 1970, p. 61.

[33] A reference to the famous competition between Zeuxis and Parrhasios, in which Zeuxis deceived the birds, while Parrhasios deceived Zeuxis; see *Pliny, Historia Naturalis*, XXXV, 65.

[34] There are a number of potential sources for Cigoli's knowledge of the camera obscura, including experience of an actual instrument. The most likely literary source is *Daniele Barbaro, La Practica della perspettiva*, Venice 1568, pp. 192-193. See also n. 15 above.

[35] *Pliny* (n. 33), XXXV, 15. Compare *Quintilian, De Institutio oratoria*, X, 2, 7; and *Alberti* (n. 20), pp. 62-63.

[36] *Pliny* (n. 33), XXXV, 77 and 135. Compare *Alberti* (n. 20), pp. 64-65.

[37] The overwhelming of sight by immoderate light was commonly discussed in late mediaeval optics, taking up the observations of *Alhazen's* Optics, I, 4, "On the Effect of Light upon Sight", and III, 4, "On Distinguishing Errors of Sight" (e.g. 68B) (in *Sabra* [n. 17]).

[38] Compare (ibid.) *Alhazen's* Optics, III, 4, 89b-90a. For Leonardo'sobservations on contrasts of colours etc., see Leonardo on Painting (n. 30), pp. 73 and 209-210.

[39] These distinctions are probably drawn from the opening of the 9th. chapter in *Aristotle's* Poetics.

[40] Compare *Alberti* (n. 20), pp. 94-95.

[41] Following *Alberti's De Pictura*, it had become standard practice to open discussions of perspective with basic definition of geometrical terms, somewhat in the manner of *Euclid's* Elements.

[42] *Leonardo*, MS. G 8r (The Literary Works of Leonardo da Vinci, ed. *J.P. Richter*, 3rd. ed., 2 vols., London/New York 1970, vol I, § 19): "Quelli che s'inamoran di pratica sanza scientia, son come 'l nochiere che entra navilio sanza timone o bussola che mai à certezza dove si vada." And Codex Urbinas 39v: "quelli che s'inamorano di praticha sanza scientia, sono come li nochieri che entran in navilio sanza timone o bussola che mai anno certezza dove si vadano."

[43] The distinction between '*semplice aspetto*' and '*prospetto officio di ragione*' is taken from *Daniele Barbaro* (n. 34), p. 6, and was later to be adopted by Poussin.

[44] This is the full-scale method of projection from the plan and elevation of an object on to the intersection (or picture plane), first fully expounded by Piero della Francesca and known to Cigoli from Barbaro and Danti-Vignola, amongst others. See *Kemp* (n. 5), pp. 32-34.

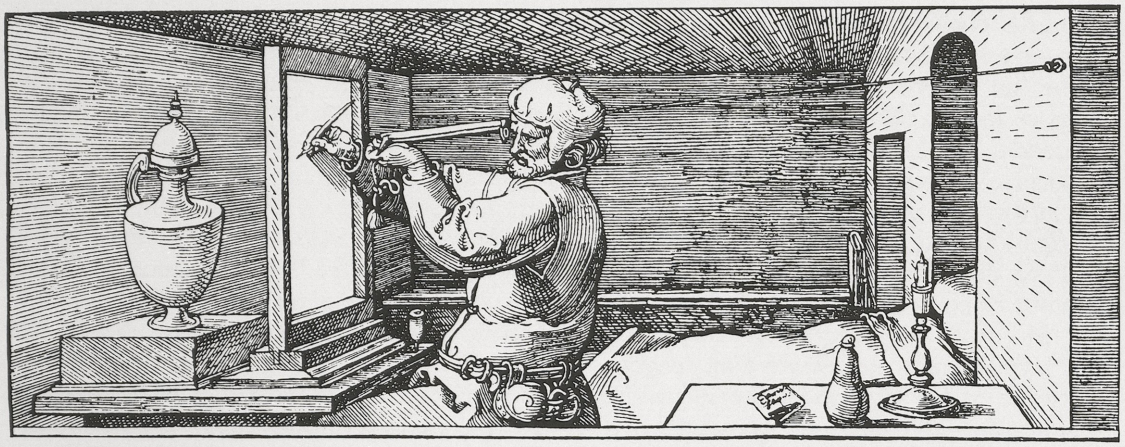
[45] This derives from the 'distance point' method, particularly popular with French theorists such as Cousin, and given definitive treatment by Danti-Vignola. Cigoli develops this method in keeping with the definition of *punctum concursus* for any given line by *Guidobaldo* (n. 14). See *Kemp* (n. 5), p. 90.

[46] Illustrated by Dürer in the woodcut dated 1525 in the 1st. ed. of the Underweysung, in which two draftsmen draw a lute in perspective using crossed wires within a frame to plot the intersection of rays of light from the lute, which are replicated by a chord attached to a pointer at one end and a notional eye-point at the other. See *Kemp* (n. 5), pl. 331.

[47] Probably the image of a draftsman using a glass 'window' to draw a portrait (1st. ed.), rather than the draftsman drawing a nude through a squared 'veil' or net (2nd. ed.). See *Kemp* (n. 5), pls. 229 and 330.

[48] *Danti-Vignola* (n. 12), pp. 56 ff. Baldassare Lanci's device is in the Museo di Storia della Scienza, Florence. See *Kemp* (n. 5), pp. 175-177.

[49] *Alberti* (n. 20), pp. 68-69, though Alberti is talking about copying nature not enlarging drawings as such. For Cigoli's machine in use for transferring designs to curved vaults, see *Kemp* (n. 5), pl. 351.



5 Albrecht Dürer, Draftsman Drawing a Vase. Woodcut, ca. 1527 (from "Underweysung der Messung mit dem Zirckel und Richtscheyt ...", 2nd ed., Nuremberg 1538, fol. Q3).

RIASSUNTO

Lodovico Cigoli non ha generalmente ricevuto, nella storia della riforma della pittura intorno al 1600, il riconoscimento che merita. È caratteristico di questa indifferenza che il maggiore dei suoi trattati a noi pervenuti, la *Prospettiva pratica*, sia rimasto inedito, benché i manoscritti agli Uffizi ed alla Biblioteca Nazionale di Firenze siano entrambi facilmente accessibili. Il Cigoli lavorava al trattato, che fa parte dei più completi scritti sulla prospettiva di ogni epoca, negli anni immediatamente precedenti alla sua morte, avvenuta nel 1612. Suo nipote, Giovanni Battista Cardi, aggiunse al manoscritto la propria biografia del pittore ed intraprese i preparativi per la pubblicazione. Benché non stampata, la *Prospettiva* era conosciuta ed ammirata in ambienti fiorentini e romani. L'innovativa macchina prospettica del Cigoli era tenuta in particolare considerazione, e ne veniva illustrato un esempio dal teorico francese Jean François Niceron nel suo *Thaumaturgus opticus* del 1646.

Il trattato del Cigoli è incentrato su tre 'regole'. Le prime due sono in strettissimo rapporto con *Le due regole* del Vignola, come vennero pubblicate nel 1583 dal matematico Ignazio Danti. Il Cigoli aggiorna la seconda regola del Vignola, che usa il cosiddetto metodo del punto distante, con riferimento alla definizione del punto di fuga di ogni data linea che il pittore trovava nei *Perspectivae libri sex* di Guidobaldo del Monte, pubblicati nel 1600. La terza regola, di cui non esistono precedenti, riguarda l'uso di strumenti prospettici per dipingere in prospettiva forme complesse.

Vengono qui pubblicati — trascritti e tradotti — tre brani concernenti questioni generali della rappresentazione e dei principi che sottostanno all'esposizione tecnica della geometria della prospettiva da parte del Cigoli. Il primo passo proviene dall'apertura del trattato e sottolinea importanza e dignità della rappresentazione visiva; fornisce poi argomenti in favore della superiorità della vista sugli altri sensi e degli occhi come 'specchi' dell'anima. Come Plinio e Leon Battista Alberti, il Cigoli specula sulle origini della pittura, ma in modo originale suggerisce che potrebbe essere stata inventata per catturare l'immagine in una camera oscura. Spiega inoltre che le cose diventano visibili grazie al contrasto di colori più scuri e più chiari, assumendo,

secondo la tradizione aristotelica, che i colori siano composti di luce ed oscurità. Nel secondo brano presenta le sue tre regole ed utilizza una libera citazione da Leonardo da Vinci affermando che 'un pittore senza prospettiva è come un marinaio in mare senza timone né bussola'. Chiarisce inoltre che la sua prima regola usa un completo procedimento di proiezione, mentre la seconda, che è più rapida da utilizzare ma più difficile da comprendere, si basa su 'punti di concorso'. Il terzo estratto presenta questa regola, che è indirizzata in modo specifico a 'giovani pittori che si dilettano nella prospettiva'. Data la difficoltà di dipingere scene complesse e la figura umana utilizzando le normali tecniche della costruzione prospettica, l'autore propugna l'uso di congegni prospettici come quelli illustrati da Albrecht Dürer ed Ignazio Danti; riconosce comunque i limiti di tutti gli strumenti esistenti, in particolare quelli che usano cordicelle, in quanto queste si incurvano per il proprio peso e causano letture erronee. Per ovviare a tali inconvenienti egli descrive un congegno inventato da lui stesso, un sistema automatizzato di disegno in cui lo spostamento di uno strumento scrivente su di un foglio di carta muove un indicatore sull'oggetto da riprodurre. Egli spiega che questo strumento può venire usato per riprodurre oggetti reali su piani piatti od inclinati, oppure, inversamente, può essere utilizzato per proiettare un disegno in prospettiva su di una parete piana o curva.

Il livello della discussione del Cigoli sui fondamenti della rappresentazione e l'ingegnosità del suo strumento forniscono una buona idea delle qualità così stimate dai suoi contemporanei, compreso Galileo.

Photo Credits:
Gabinetto Disegni e Stampe, Uffizi, Florence: Figs. 1, 3, 4. - Author: Fig. 2. - KIF: Fig. 5.