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Instruments in Robert Fludd's *Utriusque Cosmi . . . Historia*

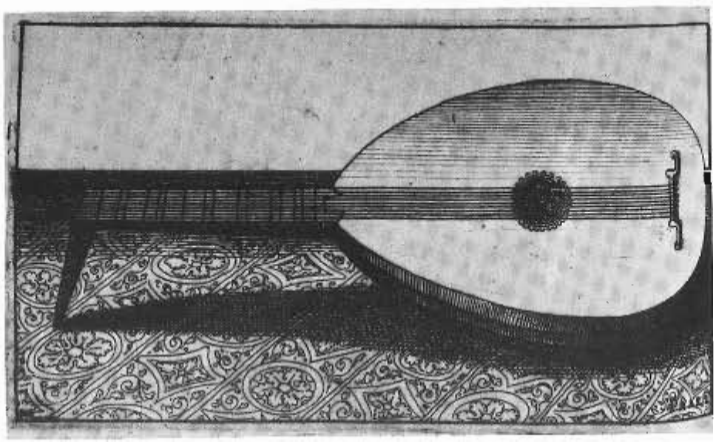
THE best-known and most massive work[1] of the English philosopher Robert Fludd (1574–1637) is very occasionally cited by writers on instruments (Galpin and Protz *inter alia*). But it is a recondite work, hard to obtain, and written in Latin: and few are sufficiently acquainted with its contents to judge, or even to describe them. The principal intention here is merely to enumerate them, so that others may decide whether this source is relevant to their purposes, and also to show the illustrations.

De Templo Musicae, the section of Fludd's encyclopaedic work which deals with music, contains as its sixth book 'De Instrumentis Musicis vulgariter notis' ('Of musical instruments commonly known'), subdivided into the following chapters:

The seventh book is entitled 'De Instrumento nostro Magno' ('Our Great Instrument') and is divided into thirteen brief chapters.[2]

I have dealt with the first two chapters elsewhere,[3] but a summary is not out of place here. The Lute, says Fludd, is the Prince of Instruments, unmatched by any other, ancient or modern (see Pl. I *a*). He gives the tuning as *C D F G c f a d' g'* (the lowest three strings optional and variable) and explains both French and Italian tablature, showing the latter without its characteristic reversal of the string order. Various aids to entabulation include a 'Circle of Transposition'[4] with all the fret positions so inscribed that a piece can be transposed into any of the twelve keys—surely a rare concept for its time.

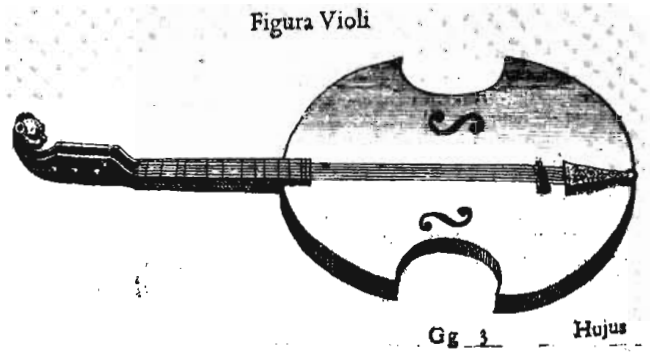
The Orpharion (Pl. I *b*) and Pandora occupy a shorter chapter, in which we learn that the former is essentially a wire-strung lute, and



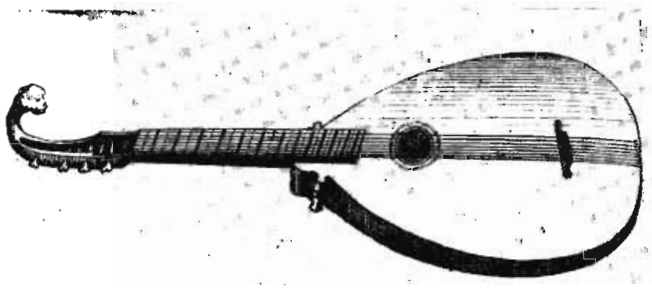
(*a*)

(*b*)

PLATE I



(*a*)



(*b*) *Differt igitur hujus instrumenti natura a cæteris prædictis, tum chordarum positione, tum earum numero, ac proinde varium*

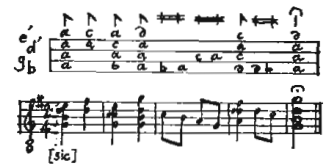
PLATE II

the latter a deeper instrument tuned either *G' C D G c e a* or *G' C F G c e a* (depending on whether one follows the text on p. 235 or the diagram on p. 236). The Orpharion can play anything possible for the Lute, while the Pandora is useful for playing the lower parts in broken consorts. Fludd is apparently unique in showing the Orpharion with frets at right-angles to the strings; and only he and William Barley show the Pandora constructed thus.[5]

Chapter III deals with the Viol (Pl. II *a*), which can be used either alone, in whole consorts, or in a broken consort which Fludd refers to thus: 'Nonnulli etiam hoc instrumentum, & praecipue ejus speciei majorem in alia instrumenta diversorum generum pulsant, ut in consortio Anglico assidue docemur'. The ungrammatical usage in the last phrase is ambiguous in meaning: but could Fludd be referring to the 'English consort' of Morley's *Consort Lessons* and similar works? Certainly he treats four of the six instruments involved in this ensemble. A more certain reference to current music-making occurs a little further on, after the tuning of the Viol has been given as *D G c f a d'*: 'today many people tune this instrument "Lyra-Way", and every day they produce more fantastic inventions, too tedious to enumerate'.[6] Alas that he did not see fit to do so!

The Cittern (Pl. II *b*) has four brass strings, all duplicated. It is used alone (commonly in barber's shops) or to play the inner parts in consorts. The tuning is not given: a diagram of the fingerboard, analagous to those which give the other instruments' tunings, lacks all specifications but the letter G at the nut of the second lowest string. (The great size of Fludd's book, together with the fact that it was printed abroad, obviously precluded perfection in proof-reading: not only did this lacuna slip through, but almost all the musical examples contain misprints.) A phrase in tablature, however, enables us to deduce the tuning as the same as given by Praetorius[7] and Holborne[8] (Ex. 1).

Tuning:



At the end of the chapter Fludd mentions some other stringed instruments: Theorbo, Lyra, Pinetta, 'La Solas'. I cannot identify the

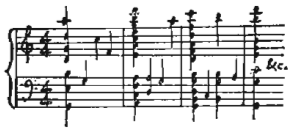
latter three in Renaissance usage—two are a complete mystery—and would be glad if a reader could do so.[9]

* * *

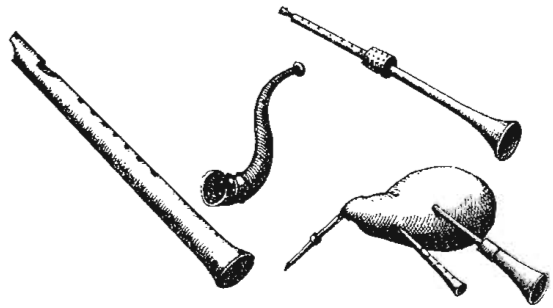
With Chapter V we begin to enter the world of fantasy. Fig. 1 shows Fludd's wind instruments: recorder, cornetto,[10] pommer, bagpipes, organetto, trumpet and post-horn. They are not so named; but Fludd at least makes an attempt in his very brief text to this chapter to divide them according to whether they have fingerholes, keyboard, or simple tubes. The organ and regal, we learn on p. 243, require a lot of practice (more than the Lute, one wonders).

The 'newly invented instruments' of Chapter VI are, first, a simple xylophone—the *Strohfidel* beloved of medieval painters of the Dance of Death.[11] According to Fludd, this was invented by some followers of Pythagorean teachings, who were inspired to place together dry sticks cut to the proportions of the scale (p. 243). The second instrument is a carillon: a simply-drawn version of that reproduced here as Fig. 8, but activated by a barrel descending upon sand, like a giant egg-timer. This is merely a feeble precursor to the climactic presentation in the final book.

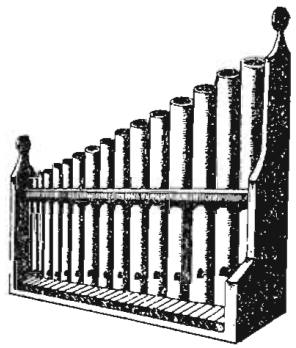
'Instrumentum nostrum Magnum' (fig. 2) is a massive harp or psaltery activated by a framework fitted with quills and dampers ('plectra tacurnitatis' of wool, shown in small woodcuts on p. 250 but not in the detail of the frame, here fig. 3). Readers may wish to decide for themselves whether this frame gives a cogent musical result: we transcribe the beginning as follows (Ex. 2).



Fludd makes many claims for the superiority of his contraption. It needs no player and is good as an entertainment at feasts (p. 245). The same mechanism can be adapted to play pipe instruments or bells; and the instrument can play all the parts usually assigned to lutes, pandoras, viols, etc. (p. 257). It is all the more effective if it can be hidden from the audience's sight. Any music adapted for it, however, must not exceed the 40 bars of C-metre which the frame allows. This is sufficient for pavans of from eight to twelve semibreves per section (presumably not repeating the three sections). Before repeating a piece one must, of



Aut in diuerſis fiſtulis unico inſtrumento inſeruientibus cuiuſmodi ſunt Regalia ſeu Organa et huiuſmodi alia.



Vel intenſiori aut remiſſiori flatus menſura, ſine mutatione digitorum de aliquo foramine ad aliud diuerſæ voces eduntur quemadmodum in Tuba clangore, cornuq; ſonitu euidenter explicatur.

FIG. 1

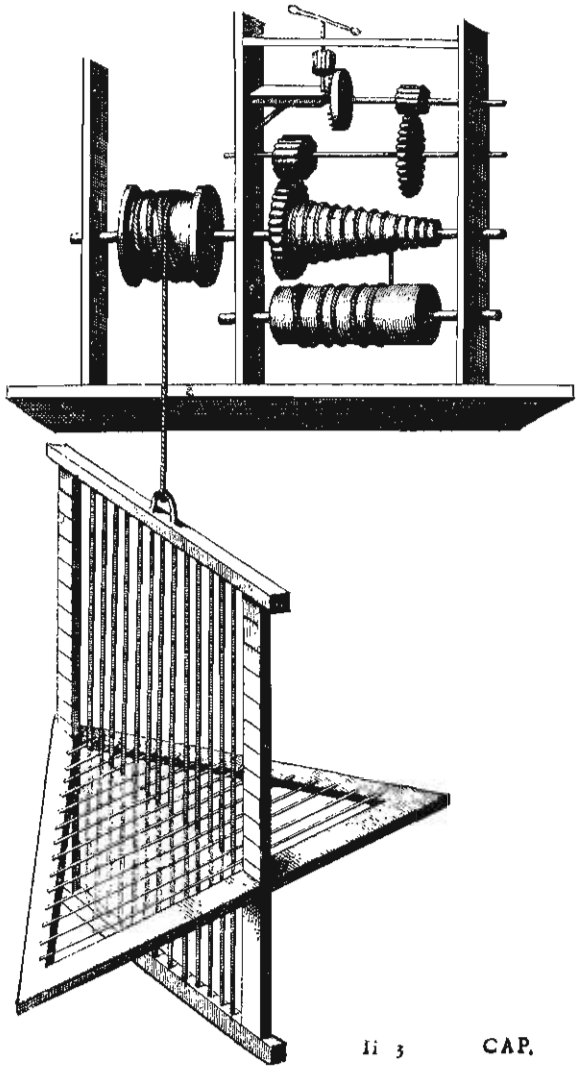


FIG. 2

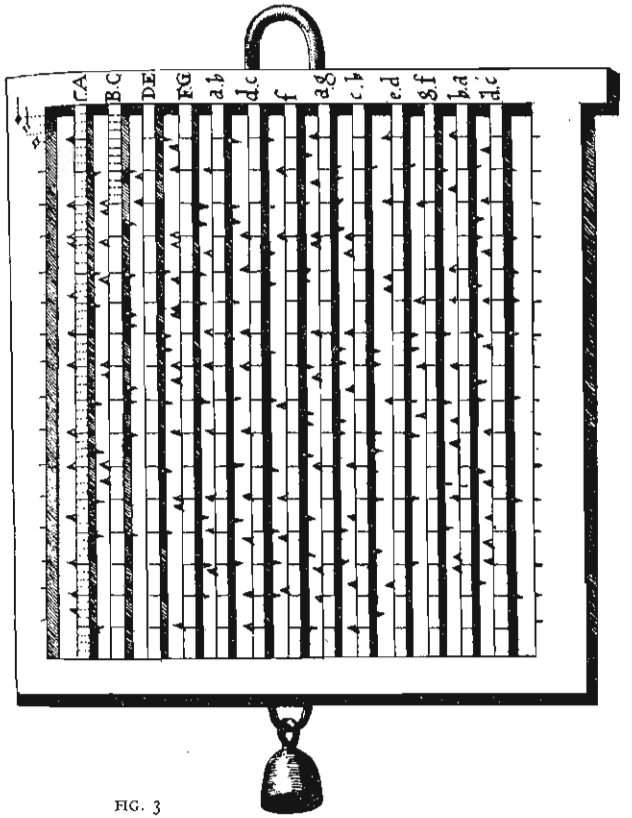


FIG. 3

course, return the frame to its high position; and on so doing one will hear something strange and entirely new (p. 258).[12] This one can well believe.

It can be seen from the list of the chapters of this book (see note 2) that Fludd is nothing if not thorough in describing his invention. All the chapters are, however, extremely short, and contain nothing that common sense does not tell us after a glance at the illustrations.

Figs. 4–8 show some other automatic instruments envisaged—we dare not say constructed—by Fludd. Figs. 4–7 appear outside the section on Music, in one dealing with machines (*De Motu*), and

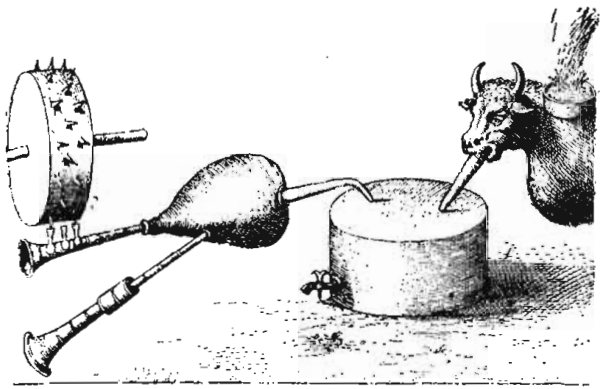


FIG. 4

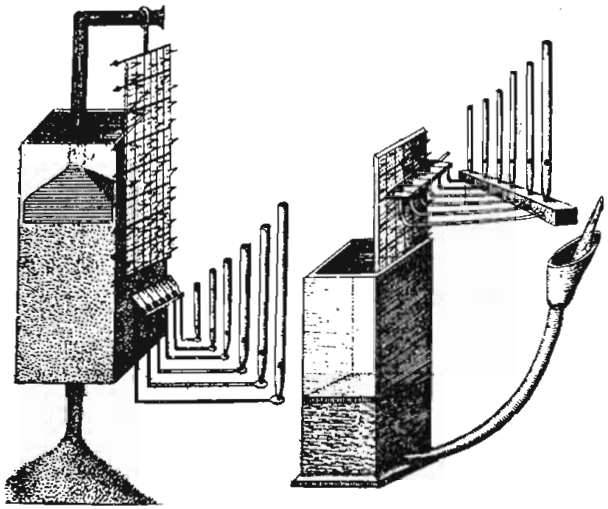


FIG. 5

mentis: Describuntur autem hoc modo, *vide Num.* 2.

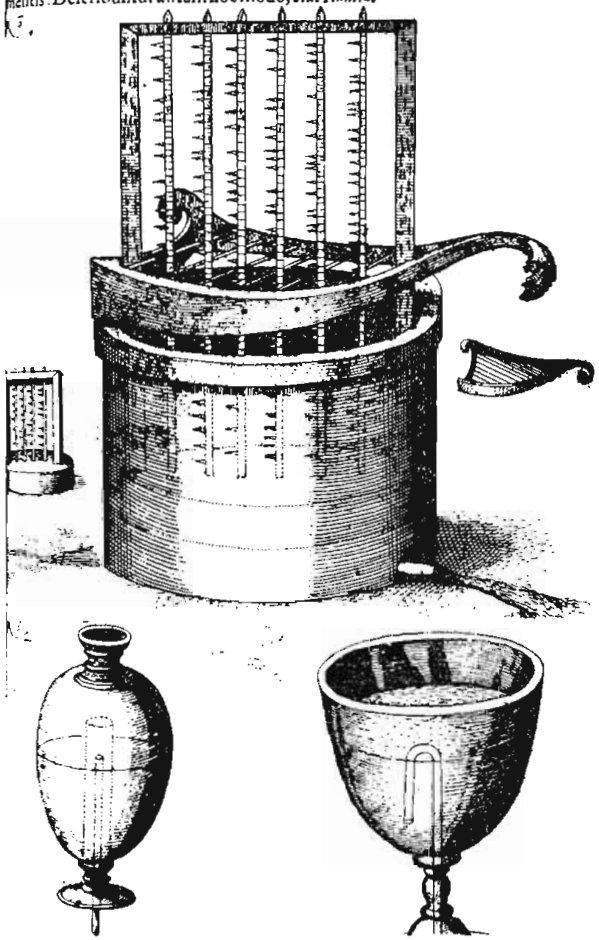
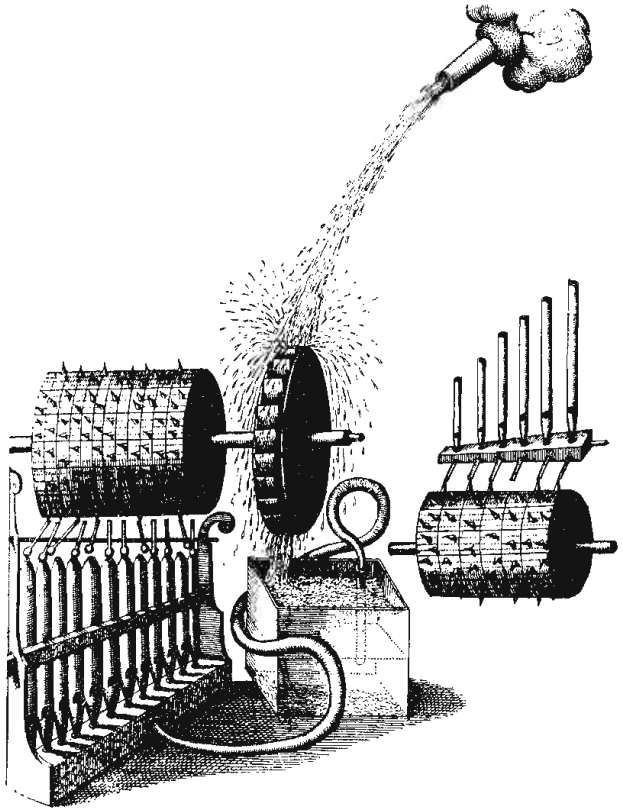


FIG. 6

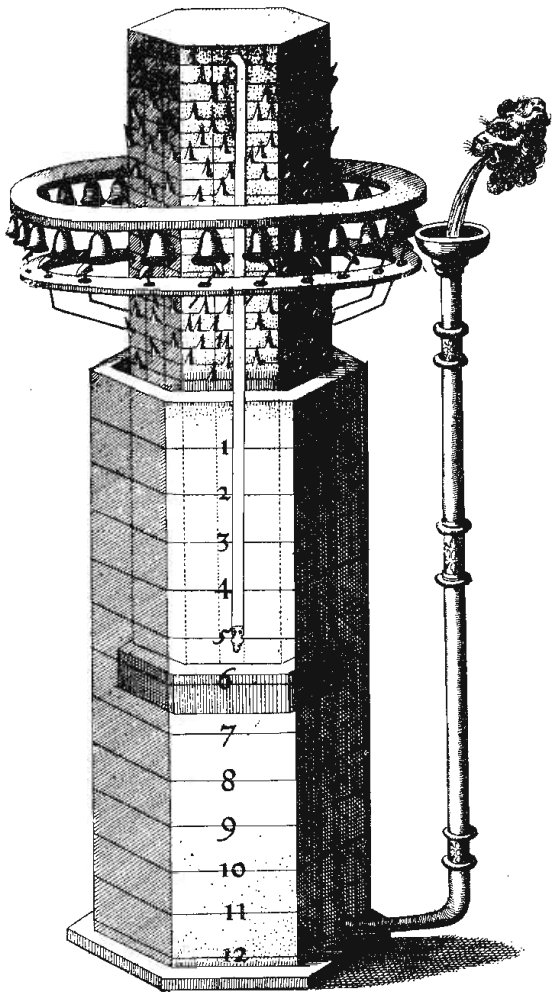


Experimentum VIII.

Moventur etiam fistularum sive organorum claves aliter sine rota, scilicet tela ascensione vel descensione alicujus ponderis, vel arenæ, vel aquæ superfluentis. Ascensione movebit machina quædam claves hoc modo. Fiat pon-

Ppp 2 dus

FIG. 7



Vuu 3 Sed

FIG. 8

specifically with harnessing the motive forces of the four elements (p. 481 ff.).[13] The instrument of fig. 8 is a development of one of the instruments 'noviter inventis', and occupies a chapter in the section on the measurement of time (*De Tempore*), as part of 'Machina nostra Horologica', another of Fludd's follies. An engraving of it (p. 525) shows the bells which are, as we learn from the text, in diatonic order from *G* to *c''* with separate bells for *B* and *B♭*: a refinement not found on the Great Instrument.

A few other instruments are to be found scattered in remote parts of this massive work. On p. 61, in the section on the art of memory (*De Arte Memoriae*), a thrice-curved cornetto with seven finger-holes is used as a mnemonic symbol for the number 5. A harp also appears on the same page, associated with the letter V. Pictures of drums occur on p. 418, in the section on military fortifications and tactics (*De Arte Militari*), on one of which is placed a needle: a clever device for detecting subterranean machinations of the enemy, which will cause the needle to rattle on the drumhead. The same page contains a truly surrealistic engraving of a person lying beneath a small tree hung with enormous jingle-bells: he is apparently engaged on the same task of detection, but one fears that the slightest breeze would cause a false alarm.

In the first volume of *Utriusque Cosmi . . . Historia* are depicted two symbolic instruments: the first (p. 91) is a harp constructed 'pyramidaliter', just like the sounding-body of the Great Instrument, with strings tuned diatonically from *G* to *g'*. It represents the Hierarchies of Being: one mounts upwards, but there comes a point where one can go no further (because where the strings stop, one is outside manifestation). The top string represents a limit, says Fludd, just as does unity in Arithmetic, or the point in Geometry. The second instrument is a recorder ('fistula') which corresponds similarly to the Cosmos. It has two lower regions with three holes each (the Elemental and Planetary realms), and a third, upper region (the Empyrean) which in the Cosmos, as in the instrument, 'dat caeteris inferioribus quasi vitam & animam' ('gives to the other, lower ones, as it were their life and soul'; p. 95). But beyond all this, it is God who provides the breath without which all the realms would perish, the recorder give no sound.

All the important engravings of instruments in the work are here reproduced except for the symbolic ones, the sand-driven carillon on p. 243, and others which exist only ill-drawn and incidentally, for example on title pages. But it should be mentioned that the book is a real treasure trove of Monochords. This simple instrument became a

central symbol of Fludd's philosophy, and it recurs in his other works as a model of the Cosmos. His monochords are of all shapes and sizes; a fair sample of them may be seen in an article by Peter Ammann on a more elevated subject than our own.[14]

Fludd's significance in the history of instruments is not great: yet it is rare to find a treatise so fully, if strangely, illustrated as this one. It is also, perhaps, worthy of consideration as an example of a learned but pre-Praetorius man's ideas on instruments—published as it was in the year before the third volume of *Syntagma Musicum*.

Fludd was obviously most interested in mechanical instruments and his must surely be one of the very earliest treatises to deal with the subject.[15] He was quoted, and his Great Instrument shown in Athanasius Kircher's *Musurgia Universalis* (1650), and again in Gaspar Schott's *Magiae Universalis*, vol. II (1657): and these are virtually the last writers to have taken any notice of him until the present century.

NOTES

1 The full title is *Utriusque Cosmi Maioris scilicet et minoris Metaphysica, Physica Atque Technica Historia* ('Metaphysical, physical and technical history of both the greater and the lesser cosmos'), published at Oppenheim, 1617–1621. The treatise on Music is in the second volume, *De Naturae Simia . . .* ('The Ape of Nature'), published in 1618, pp. 159–258. Page references in the present article are to this volume. The illustrations in the article are from originals in the History of Science Collections, Cornell University Libraries.

2 The chapter headings are as follows:

I	De instrumento nostro & de generalia ejus compositione ('our instrument and its general structure')	245
II	De corporis sonantis structura ('the sounding-body')	245
III	De fabricae cursoriae structura ('the moving frame')	247
IV	De machinae moveniis sive primi mobilis descriptione ('the mechanism')	250
V	De vera instrumenti cum sua fabrica cursoria & machina movente positione ('how to set it up with its various parts')	252
VI	De modo disponendi cantum Bassum alicujus Symphoniae ad hoc instrumentum ('how to adapt the Bass part of a piece to this instrument')	254
VII	De dispositione notularum Tenoris super hujus fabricae costis ('how to adapt the Tenor')	255
VIII	De adaptione cantum Contratenoris & medii ad hujus fabricae cursoriae usum ('how to adapt the Contratenor')	256
IX	De translatione cantus superioris seu Discanti ad nostrae fabricae cursoriae usum ('how to adapt the Discant')	257
X	Quod multa alia instrumenta Musica ad motum istius instrumenti magni sonare possint ('how many other	

instruments can be built on this principle') 257

XI De motione istius instrumenti & quomodo ab oculis auditorum sit occultandum? ('how the instrument moves, and how it may be hidden from the listeners') 258

XII De speciebus Cantus, quae ad hoc nostrum instrumentum referri debent ('the kind of pieces suitable') 258

XIII De cantilenae ejusdem in hoc instrumento repetitione ('how to repeat a piece on the instrument') 258

3 'Robert Fludd on the Lute and Pandora', in *The Lute Society Journal*, September 1973.

4 On p. 232: reproduced in *ibid.*

5 William Barley, *A New Booke of Tabliture*, London 1591, has engravings of both instruments. Fludd depicts only the Orpharion, but a diagram (p. 236) shows clearly the frets and strings of the Pandora. Donald Gill, 'The Orpharion and Bandora', *GSJ*, XIII (1960) gives extremely thorough information on these instruments.

6 The text, here translated freely, runs: 'Hodierno vero die multifarium tendunt Musici hujus instrumenti chordas, dispositionem ejus ad Lyrae naturam convertentes, novasque quotidie inventiones phantastico Musicorum more producentes, quas, quia nimis foret taediosum eas hoc loco exprimere, jam omittemus.' (p. 238-9).

7 Michael Praetorius, *Syntagma Musicum* (1615–18). This is given as the Italian tuning, as opposed to the French *a g d' e'*.

8 Anthony Holborne, *The Cittharn Schoole*, London, 1597, also gives a lower tuning *e c g a*.

9 The text runs: 'Sunt etiam complura alia instrumenta hujusmodi dispositionis, quorum unum dicitur *Theorba*, quae ex gravibus vel subgravibus compacta est. Aliud est *Lyra*, aliud *Pinetta*, aliud, quod vocant *La Solas*, & multa alia, quae brevitatis gratia hoc in loco praetereunda putamus . . .' (p. 241).

10 This does not look very much like a cornetto, but it does resemble several other more plausible examples shown elsewhere in the work, and is certainly placed among the fingered instruments.

11 and apparently current in Fludd's time: see an example with 15 keys in Van de Venne's 'Fête de la trêve de 1609' (in the Louvre), reproduced in *Larousse de la Musique*, Paris 1957, vol. I, opposite p. 192. I have omitted Fludd's crude woodcut of the instrument on p. 243.

12 '. . . in fabricae ascensa Musicam aliam percipies a prima differentem, ita ut Musica plane nova & inaudita audiri videatur.'

13 The section concerned, *De Motu*, is comparable to *De Templo Musicae*: it is Part VII of *De Naturae Simia*, and the relevant subsection of it is Book III, 'De motu ex quatuor Elementorum naturis generato'.

14 'The Musical Theory and Philosophy of Robert Fludd', *Journal of the Warburg and Courtauld Institutes*, XXX (1967), p. 198–227.

15 Salomon de Caus' *Les raisons des forces mouvantes* apparently gives very clear directions for pinning a barrel and operating a mechanical instrument by water power.