

欧几里得

几何原本

OUJILIDE
JIHEYUANBEN

陕西科学技术出版社

欧几里得

几何原本

兰纪正 朱恩宽 译

梁宗巨 张毓新 徐伯谦 校订

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THE THIRTEEN BOOKS OF EUCLID'S ELEMENTS

Translated from the Text of Heiberg

with Introduction and commentary

by T. L. Heath

Dover Publications, Inc. New York, 1956

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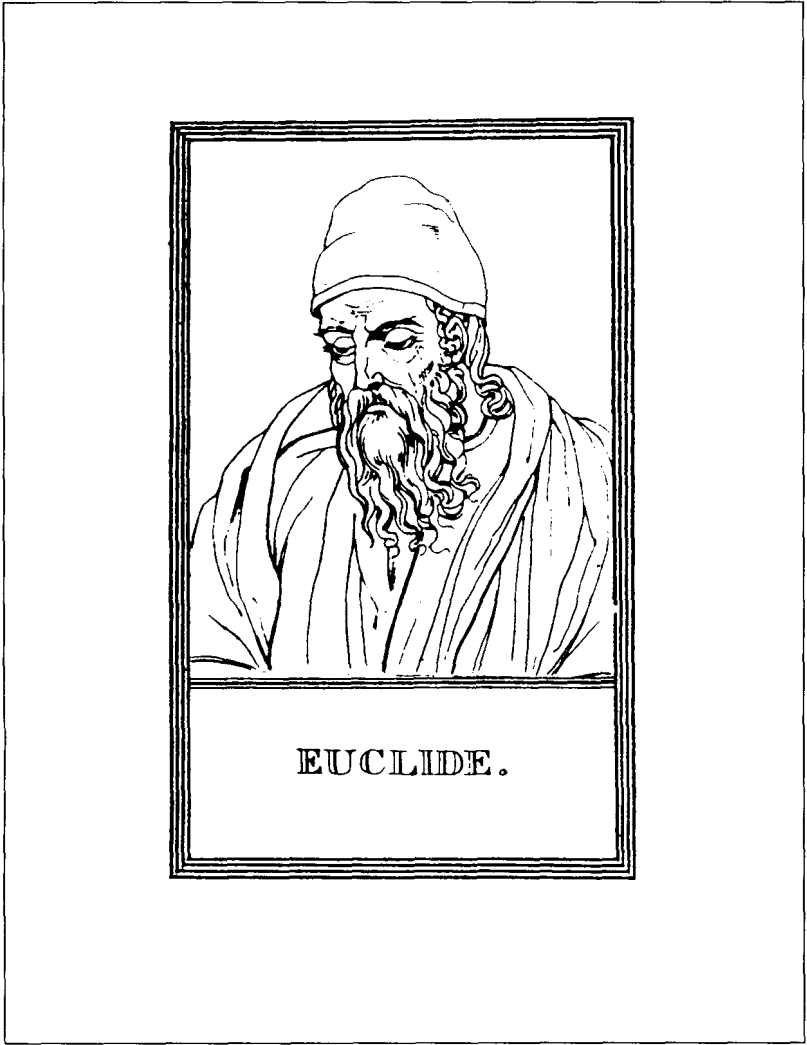
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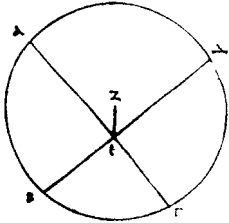
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欧几里得画像

画像选自Charles Thomas-Stanford, *Early Editions of Euclid's Elements*. San Francisco Alan Wofsy Fine Arts, 1977. 的扉页。

βὰν ἐκ κύκλου δύο ἀσφαὶ τμήματα ἀπέχου μηδενὸν κέν-
 τρου οὐσὰν οὐτήν οὐσιν ἀπέχου διχῶν. ὅτε κύκλος ὁ
 ΔΒΓΔ ὑπερκαταί δύο ἀσφαὶ εἰ ΔΓ ΒΔ τμήματα ἀπέχου
 καταταί μὴδενὸν κέντρου οὐσὰν. λέγουσιν οὐτήν οὐσιν
 ἀπέχου διχῶν ἕνα ἄρδωμνον τμήματα ἀπέχου διχῶν
 ὡστὶ ἴσῃ εἶναι τῆν κέντρ ΔΕ τῆν ΕΓ. τῆν ΔΕ βε τῆν ΕΔ ὑ-
 πὲρ ἄνω το κέντρον τοῦ ΔΒΓΔ κύκλου ὑπερκαταί τὸ Ζ ὑπερ-
 κάχθῃ ἢ ΖΕ. ὡστὶ οὐ ἀσφαί τῶν κέντρον ἢ ΖΕ ἀσφαί
 ἄρδωμνον τῆν ΔΓ διχῶν τμήμα. ὑπερκαταί τῶν ἀσφαί
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 ἄρδωμνον ΒΔ διχῶν τμήμα. ὑπερκαταί τῶν ἀσφαί
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 ἄρδωμνον τῆν κέντρον. ὡστὶ ἄρδωμνον οὐκ ἄρα
 εἰ ΔΓ ΒΔ τμήματα ἀπέχου διχῶν. βὰν ὀρα βὲν κύκλοι δύο
 ἀσφαὶ τμήματα ἀπέχου ὑπερκαταί τῶν ὡστὶ ἕνα ἄρδωμνον.
 ὡστὶ ἕνα ἄρδωμνον. ὡστὶ ἕνα ἄρδωμνον. οὐκ ἄρα τῶν
 τῶν δύο κύκλοι τμήματα ἀπέχου. οὐκ ἄρα τῶν τῶν
 το κέντρον. δύο γὰρ κύκλοι οἱ ΔΒΓ ΓΔΗ τμήματα ἀπέχου
 ἀπέχου καταταί βε ὀρθὴ. λέγουσιν οὐκ ἄρα τῶν τῶν
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 ὑπερκαταί ἢ ΕΖΝ ὡστὶ ἕνα ὑπερκαταί τὸ Ε ὀρθὴ κέντρον
 ἀσφαί τοῦ ΔΒΓ κύκλου. ἴσῃ ἄρδωμνον ἢ ΕΓ τῆν ΕΖ. ὡστὶ ἕνα ὑπερκαταί
 τὸ Ε ὀρθὴ κέντρον ἀσφαί τοῦ ΓΔΗ κύκλου. ἴσῃ ἄρδωμνον ἢ ΕΓ τῆν
 ΕΗ. ἕνα ἄρδωμνον ἢ ΕΓ ὑπερκαταί ΕΖ ἴσῃ. ὑπερκαταί ΕΖ ἄρα τῆν ΕΗ



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the teaching of the subject for eighteen hundred years preceding that time. He is the only man to whom there ever

29. *7 unquam unum parum ducatur qui in pducatur par*

30. *7 unquam duca impar qui pducatur erit impar*

31. *7 si unquam unum parum ducatur qui in pducatur par*

32. *7 si impar impari miter ipse*

33. *7 si duo par unum parte meti*

38. *7 si duo impar ab aliquo sunt*

39. *7 unum aduobus dupli erit par*

40. *7 unum cui medietas e impar*

41. *7 si duo impar ab aliquo sunt*

42. *7 si duo impar ab aliquo sunt*

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100. *7 si duo impar ab aliquo sunt*

PAGE FROM A TRANSLATION OF EUCLID'S ELEMENTS

This page is the first page of the translation of the propositions on the subject of the division of numbers in Book IX of the Elements. The first five propositions are as usually numbered in modern editions.

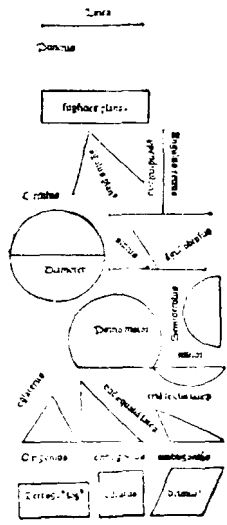
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Præclarissimus liber elementorum Euclidis periphrasice in Latinam linguam Geometricæ inceptu quâlochocho lineæ

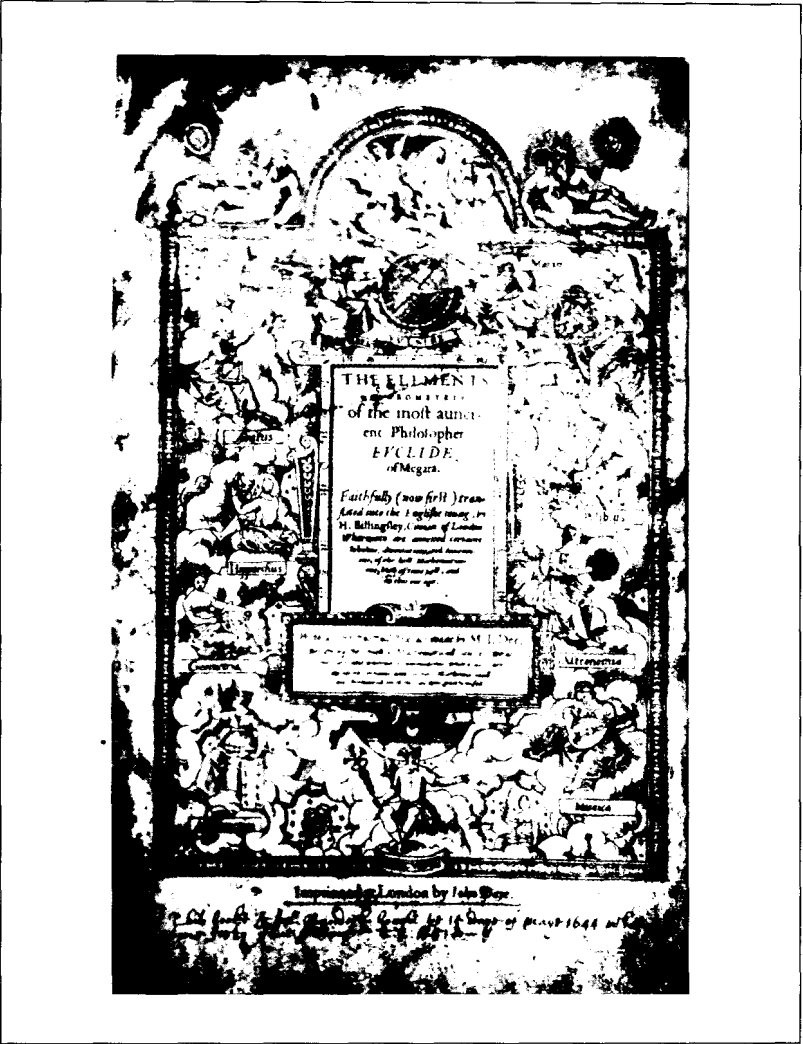


Linæ est cuius pars non est. Linea est
 longitudo sine latitudine cuius quidam ex
 terminatus. It duo puncta. Linea recta
 est ab uno puncto ad alium brevissima exten-
 sio in extremitates suas utriusque eorum recti-
 pennis. Superficies est quæ longitudinem et lan-
 tudinem habet. cuius terminus quidam sunt lineæ.
 Superficies plana est ab una linea ad al-
 teram extensio in extremitates suas recipiens.
 Angulus planus est duarum linearum al-
 ternis partibus quæ expansio est super super-
 ficem applicatamque non directam. Quando autem angulum præbet due
 lineæ recte reclinate angulus notatur. In recta linea super rectam
 fuerit duorum angulorum utrobique fuerit æquales eorum uterque rectus erit.
 Linea quoque lineæ superflua ei cuius superflua perpendicularis vocatur. An-
 gulus vero qui rectus minor est obtusus dicitur. Angulus vero minor re-
 cto acutus appellatur. Terminus est quo emulcaulus terminus est. Figura
 est quæ terminus est terminus præbet. Circulus est figura plana una quædam li-
 nea præbet quæ circuli peripheria notatur in cuius medio punctus est quo omnes
 lineæ recte ad circuli peripheriam exten-
 siones sunt æquales. Et hic
 quidam punctus est in circuli centro.
 Diameter circuli est linea recta que
 super et infra præbet extremitatesque suas circuli peripheriam applicans
 circuli in duo media dividit. Semicirculus est figura plana dia-
 metro circuli in medietate circuli peripheriam præbet. Porro circuli
 peripheria est figura plana recta linea in parte circuli peripheriam præbet. Semitri-
 culo quidam maior aut minor. Rectilineæ figuræ sunt quæ recto li-
 neis continentur quarum quedam trilateræ quæ tria recta lineis. quedam
 quadrilateræ quæ quatuor rectis lineis. quedam multilateræ quæ pluribus
 quæ quatuor rectis lineis continentur. Aliæ figurarum trilaterarum alia
 est triangulus duobus tria latera equalia. Aliæ triangulus duobus
 equalia latera. Aliæ triangulus tria unequalia latera. Itaque iterum
 alia est orthogonum. unum in rectum angulum habens. Aliæ est am-
 bigonum aliquem obtusum angulum habens. Aliæ est angou-
 sum in quo tres anguli sunt acuti. Figurarum autem quadrilaterarum
 alia est quadratum quod est equilaterum atque rectangulum. Aliæ est
 rectangulum longum quod est figura rectangula sed equilatera non est.
 Aliæ est belmastrum. que est equilatera sed rectangula non est.

De principis præbet et terminis de effertur
 terminibus earundem.



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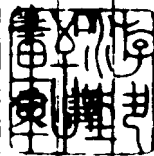
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Item, sub aequalibus rectis lineis contentum, & basim BC basi EF aequalem habebunt; eritque triangulum BAC triangulo EDF aequale, ac reliquis angulis B, C reliquis angulis E, F aequales erunt, uterque utriusque, sub quibus aequalia latera subtenduntur.

Si punctum D puncto A applicetur, & recta DE rectae AB superponatur, cadet punctum E in B, quia $DE^a = AB$. Item recta DF cadet a hyp. in AC, quia ang. $A^b = D$. Quinetiam punctum E puncto C coincidet, quia $AC^c = DF$. Ergo rectae EF, BC, cum eisdem habeant terminos, ^b congruent, & proinde aequales sunt. ^{b 14. ax. *} Quare triangula BAC, EDF; & anguli B, E; itemque anguli C, F etiam congruunt, & aquantur. Quod erat Demonstrandum.

PROP. V.



Isoscelium triangularum ABC qui ad basim sunt anguli ABC, ACB inter se sunt aequales. Et productis aequalibus rectis lineis AB, AC qui sub base sunt anguli CBD; BCE inter se aequales erunt.

^a Accipe $AF = AD$, & ^{a 3. 1.} ^b iunge CD, ac BF. ^{b 1. p. ff.}

Quoniam in triangulis ^c ACD, ABF , sunt $AB^c = AC$, & $AF^d = AD$, ^d ^e ^f ^g ^h ^k
^e angulusque A communis, erit ang. $ABF = ACD$; ^{e 4. 1.}
 & ang. $AFB^e = ADC$, & bas. $BF^e = DC$,
 item $FC^f = DB$. ergo in triangulis BFC, BDC ^{f 3. ax.}
^g BDC erit ang. $FCE = DCB$. ^{g 4. 1.} Q. E. D. Item ^h
 ideo ang. $FBC = DCB$. atqui ang. $ABF^h =$ ^{h pr.}
 ACD . ergo ang. $ABC^k = ACB$. Q. E. D. ^{k 3. ax.}

Corollarium.

Hinc, Omne triangulum aequilaterum est quocumque aequiangulum.

PROP.

公元1655年巴罗 (I. Barrow) 拉丁文译本《原本》的一页, 卷I命题5“驴桥”。

**THE THIRTEEN BOOKS OF
EUCLID'S ELEMENTS**

TRANSLATED FROM THE TEXT OF HEIBERG

WITH INTRODUCTION AND COMMENTARY

BY

SIR THOMAS L. HEATH,
K.C.B., K.C.V.O., F.R.S.,

SC.D. CAMB., HON. D.SC. OXFORD

HONORARY FELLOW (SOMETIME FELLOW) OF TRINITY COLLEGE CAMBRIDGE

SECOND EDITION

REVISED WITH ADDITIONS

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*при редакционном
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И. Н. ВЕСЕЛОВСКОГО

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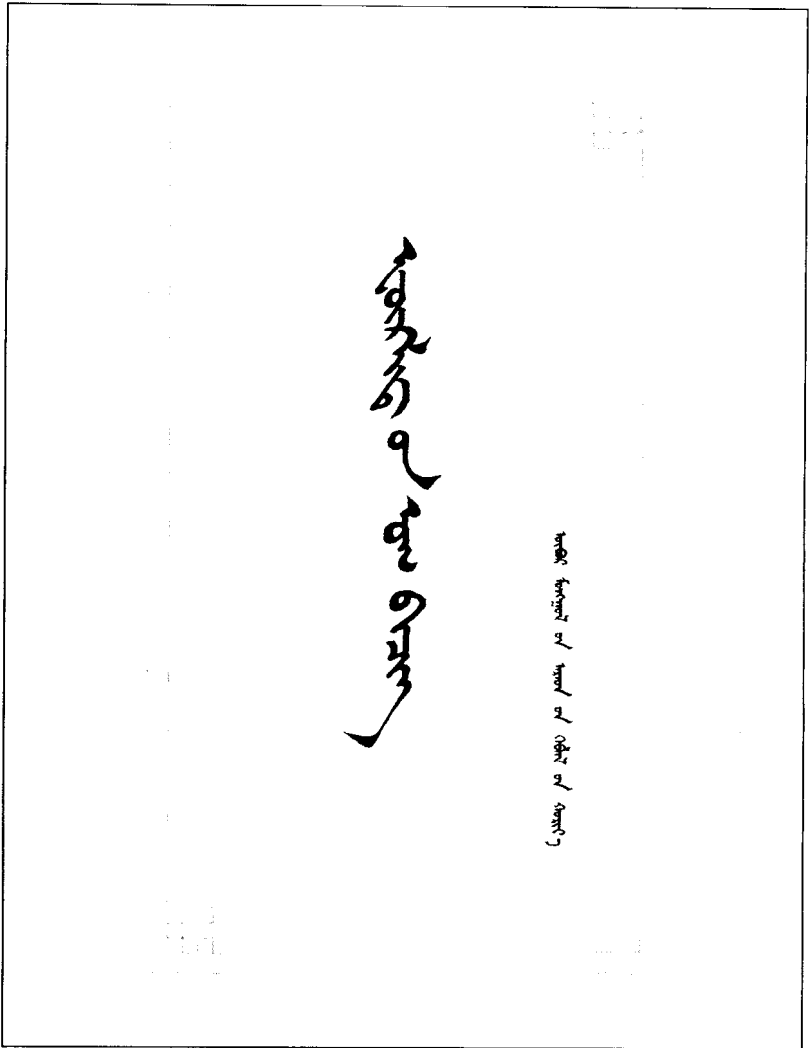
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ΕΥΚΛΕΙΔΟΥ

ΣΤΟΙΧΕΙΑ

共立出版株式会社

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序

欧几里得《几何原本》是世界名著,在各国流传之广、影响之大仅次于基督教的《圣经》.我国在明清两代有过译本,前6卷是利玛窦和徐光启合译的,1607年出版.底本是德国人克拉维乌斯(C. Clavius)校订增补的拉丁文本 *Euclidis Elementorum Libri XV*(《欧几里得原本15卷》,1574年初版).后9卷是英国人伟烈亚力和李善兰合译的,1857年出版,底本是另一种英文版本.这种底本都是增补本,和欧几里得原著有很大的出入,不少内容是后人修改或添加上去的.明清本的最初翻译距今已好几百年,现在不容易找到,况且又是文言文,名词术语不是现代语言,这更增加了阅读的困难,因此重新翻译是十分必要的.

本书根据目前标准的希思(Thomas Little Heath, 1861 ~ 1940)英译评注本 *The thirteen books of Euclid's Elements*(《欧几里得原本13卷》,1908年初版,1926年再版,1956年新版)译出,而希思本又是以海伯格(John Ludwig Heiberg, 1854 ~ 1928,丹麦人)与门格(H. Menge)的权威注释本 *Euclidis opera omnia*(《欧几里得全集》,1883 ~ 1916出版,希腊文拉丁文对照)为底本的,应该说比明清本所根据的底本更可靠,而且更接近欧几里得的原著.

兰纪正副教授、朱恩宽副教授积多年的几何教学经验,参考了明清本以及不同文字的几种版本,译成汉文后广泛征求了意见,数易其稿,当能较好地表达欧几里得的基本精神.

多少年来,千千万万人通过欧几里得几何的学习受到了逻辑的训

练,从而迈入科学的殿堂.大科学家牛顿在撰写他的名著《自然哲学之数学原理》(Philosophiae naturalis principia mathematica, 1687)时,就曾受到几何公理方法的启迪.他在序中写到:“从那么少的几条外来的原理,就能够取得那么多的成果,这是几何学的光荣”(It is the glory of geometry that from so few principles, fetched from without, it is able to accomplish so much)^①.今天,我们仍然不断从几何中吸取营养.无论从数学史或从数学教育的角度,《原本》都永远是有价值的参考书.希望这个译本能在祖国的文化建设中起到应有的作用.

希思本附有大量的注文,它不仅是原文的诠释,而且可以看作是两千年来研究《原本》的历史总结.如将注文全部译出,可帮助读者进一步了解原文的内容,并知道各个定义、命题、方法的来龙去脉.不过工作量很大,只好留待将来.这里不妨借用一下徐光启的话:“续成大业,未知何日,未知何人,书以俟焉.”

梁宗巨

1986.12.8

^① R. E. Moritz, On mathematics and mathematicians (1914)P.293.