

# THE HISTORY OF CONTACT LENSES

Volume One

**Early Neutralizations of the Corneal Dioptric Power**

**Robert Fernand Heitz**

M.D. Faculty of Medicine, University of Strasbourg, France  
Emeritus Chief, Dept. of Ophthalmology, Hospital Center, Haguenau, France  
Ph.D. Historical and Philological Sciences (EPHE, Paris)  
Research Fellow, Dept. for the History and Philosophy of Life and Health Sciences,  
Medical Faculty, University Louis Pasteur, Strasbourg

With the collaboration of

**Wulf Ehrlich**

Professor Emeritus, Faculty of Medicine, University of Homburg/Saar, Germany

**Jay M. Enoch**

Professor of the Graduate School and Dean Emeritus, School of Optometry,  
Berkeley, University of California

and

**C. Richard Keeler**

London

*Translated by*

*Colin Mailer, FRCS (C), London/ON Canada*

**Robert Fernand Heitz**

**THE HISTORY  
OF  
CONTACT LENSES**

**Volume One**

**Early Neutralizations of the Corneal Dioptric Power**

# Contents

## INTRODUCTION

<b>CHAPTER 1 : Leonardo da Vinci's Ocular Immersions</b> .....	1
INTRODUCTION.....	3
1 – SOURCE DOCUMENTS .....	5
1.1 - MANUSCRIPT D FROM INSTITUT DE FRANCE.....	5
1.1.1 – FOLIO 3 VERSO OF MANUSCRIPT D.....	7
1.1.2 - FOLIO 7 VERSO OF MANUSCRIPT D.....	19
1.1.3 - FOLIOS 3 VERSO AND 7 VERSO IN THE CONTEXT OF MANUSCRIPT D.....	30
1.2 - MANUSCRIPT K FROM INSTITUT DE FRANCE.....	31
1.2.1 – FOLIO 118 VERSO OF MANUSCRIPT K.....	31
1.2.2 – FOLIO 119 RECTO OF MANUSCRIPT K.....	33
1.3 - FOLIO 222 RECTO/A OF CODEX ATLANTICUS.....	35
1.3.1 - THE GLASS HEMISPHERE OF FOLIO 222 RECTO/A.....	37
1.3.2 - THE TEXT AND THE DIAGRAMS OF THE UPPER PART OF THE FOLIO.....	39
2 - DISCUSSION .....	41
2.1 - THE WRITINGS OF LEONARDO DA VINCI IN THE CONTEXT OF THE KNOWLEDGE OF HIS ERA ...	41
2.1.1 - OCULAR ANATOMY AND PHYSIOLOGY AT THE TIME OF THE RENAISSANCE.....	41
2.1.2 - LEONARDO'S WRITING IN THE CONTEXT OF THE 'PERSPECTIVA' .....	44
2.2 - LEONARDO DA VINCI, A GENIAL INVENTOR OR A WITNESS OF HIS TIMES? .....	52
2.3 - THE IMPACT OF LEONARDO DA VINCI AND HIS LEGACY .....	53
3 - LEONARDO DA VINCI, NEUTRALIZATION OF THE CORNEAL DIOPTIC POWER AND CONTACT LENSES .....	54
3.1 -FOLIOS 3 VERSO AND 7 VERSO OF MANUSCRIPT D.....	54
3.2 - FOLIO 118 VERSO OF MANUSCRIPT K .....	55
3.3 - FOLIO 222 RECTO/A OF CODEX ATLANTICUS.....	55
4 - A SHORT HISTORY OF THE ORIGIN AND THE PROPAGATION OF SEVERAL MISINTERPRETATIONS .....	57
4.1 - THE FALSE INTERPRETATIONS OF THE EXTRACTS OF MANUSCRIPT D.....	58
4.2- ERRORS RELATING TO DIAGRAMS AND TEXTS OF FOLIO 118 RECTO OF MANUSCRIPT K.....	59
4.3 - ERRORS RELATING TO DIAGRAMS AND TEXTS OF FOLIO 222 RECTO/A OF CODEX ATLANTICUS...	64
APPENDIX	
TRANSCRIPTION OF THE TITLES AND SUBTITLES OF MANUSCRIPT D.....	67
<b>CHAPTER 2 : René Descartes' Contact Tube</b> .....	69
INTRODUCTION.....	69
1 - SOURCE DOCUMENT : THE DISCOURSE SEVENTH: "DES MOYENS DE PERFECTIONNER LA VISION".....	73
1.1 - THE OBJECT OF REGARD .....	73
1.2 - WHAT DETERMINE THE HEIGHT OF THE OBJECT?.....	74
1.3 - HOW TO ENLARGE THE RETINAL IMAGE ? .....	76
1.4 - PRODUCE AN ARTIFICIAL LENGTHENING OF THE EYE BY THE WATER-TUBE.....	77
1.5 - THE ALTERNATIVE OF THE FULL TUBE AND THE TELESCOPE .....	80
1.6 - OTHERS CONSIDERATIONS.....	81
2 - DISCUSSION .....	82
2.1 - CRITICAL ANALYSIS OF THE ELEMENTS OF THE DISCOURSE SEVENTH .....	82
2.1.1 - THE CONTACT-TUBE, A MODEL OF CARTESIAN REASONING IN FOUR STEPS.....	82

2.1.2 - CRITICAL ANALYSIS OF DESCARTES' DEMONSTRATION .....	83
2.2 - THE CONTACT TUBE AND CARTESIAN PHILOSOPHY .....	86
3 - DESCARTES, CORNEAL DIOPTRIC POWER NEUTRALIZATION AND CONTACT LENSES.....	89
4 - A SHORT HISTORY OF THE ORIGIN AND THE PROPAGATION OF SEVERAL MISTAKES .....	91
APPENDIX	
TRANSCRIPTION OF RENÉ DESCARTES, "DISCOURS SEPTIÈME - DES MOYENS DE PERFECTIONNER LA VISION".....	95
<b>CHAPTER 3 : Christian Huygens' Contact Cone .....</b>	<b>101</b>
INTRODUCTION.....	103
1 - SOURCE DOCUMENTS .....	105
1.1 - DESCARTES' DESCRIPTION IS FLAWED .....	106
1.2 - THE ARGUMENTS OF HUYGENS .....	106
2 - DISCUSSION .....	110
2.1- HUYGENS AND THE THEORY OF LIGHT .....	110
2.2 - HUYGENS AND THE FRENCH ROYAL ACADEMY OF SCIENCES .....	111
2.3 - THE APPLICATIONS OF THE CONE IN THE 17TH AND 18TH CENTURIES .....	111
3 - HUYGENS, THE NEUTRALIZATION OF CORNEAL DIOPTRIC, AND CONTACT LENSES.....	112
APPENDIX	
TRANSCRIPTION OF CHRISTIAN HUYGENS', "TRACTATUS DE REFRACT. ET TELESC. LIBER II. 1653. PROPOSITION XI" .....	113
<b>CHAPTER 4 : Philippe de La Hire's Ocular Contact .....</b>	<b>114</b>
INTRODUCTION.....	117
1 - SOURCE DOCUMENTS .....	119
1.1 - THE PUBLICATIONS OF LA HIRE .....	119
1.1.1 - THE LECTURE TO THE FRENCH ROYAL ACADEMY OF SCIENCES (1685).....	119
1.1.2 - THE PUBLICATION IN THE JOURNAL DES SÇAVANS (1685) .....	120
1.1.3 - THE PUBLICATION OF THE "TRAITÉ DES DIFFÉRENS ACCIDENS DE LA VUË" (1694) .....	121
1.1.4 - THE POSTHUMOUS PUBLICATION OF LA HIRE'S WORKS (1730).....	123
1.2 - SUMMARY AND ANALYSIS OF CHAPTER 28.....	124
1.2.1 - ON THE USEFULNESS OF CONCAVE LENSES FOR THOSE HAVING A VERY CONVEX CRYSTALLINE LENS .....	125
1.2.2 - ON THE USEFULNESS OF CONCAVE LENSES FOR THOSE HAVING A WELL-CONFORMED CRYSTALLINE LENS .....	127
1.2.3. - ON THE USEFULNESS OF CONCAVE LENSES FOR THOSE HAVING A VERY LONG EYE .....	128
2 - DISCUSSION .....	129
2.1 - CHAPTER 28 IN THE CONTEXT OF LA HIRE'S TREATISE .....	129
2.1.1 - PUPILLARY MOTILITY AND PRESBYOPIA LINKED TO THE AGING PROCESS.....	130
2.1.2 - CRYSTALLINE LENS AND THE CATARACT .....	131
2.1.3 - THE RETINA, STRABISMUS AND ENTOPTIC PHENOMENA .....	132
2.1.4 - THE "THREE TYPES OF SIGHT", ACCOMMODATION AND QUANTIFIED CORRECTION.....	133
2.1.5 - LA HIRE'S OPTOMETER AND SCHEINER'S EXPERIMENT .....	135
2.2 - AN APPRECIATION OF LA HIRE'S WORK.....	136
2.2.1 - THE VIEWPOINT OF A PHYSICIST.....	136
2.2.2 - THE APPRECIATION OF LA HIRE BY HIS CONTEMPORARIES .....	136
3 - LA HIRE, CORNEAL DIOPTRIC POWER NEUTRALIZATION AND CONTACT LENSES.....	138

4 - A SHORT HISTORY OF SEVERAL MISINTERPRETATIONS AND THEIR PROPAGATION .....	141
4.1 - THE ANALYSIS OF LEVENE.....	141
4.2 - THE PROPAGATION OF ERRORS.....	144
APPENDIX 1	
TRANSCRIPTION OF PHILIPPE DE LA HIRE, “DISSERTATION SUR LA CONFORMATION DE L’OEIL” (1685) .....	147
APPENDIX 2	
TRANSCRIPTION OF PHILIPPE DE LA HIRE, CHAPTER 28 “DE L’UTILISÉ DES VERRES CONCAVES” IN, “DISSERTATION SUR LES DIFFÉRENS ACCIDENS DE LA VUË” (1694, 1730) .....	152
<b>CHAPTER 5 : Jean Méry’s Neutralization of Corneal Dioptric Power in a Living Eye .....</b>	<b>155</b>
INTRODUCTION.....	157
1 - SOURCE DOCUMENTS .....	159
1.1 - MÉRY’S PRESENTATION AND HIS EDITORIAL (1704) .....	160
1.1.1 - MÉRY’S LECTURE OF 12TH NOVEMBER 1704 “DES MOUVEMENTS DE L’IRIS” .....	160
1.1.2 - FONTENELLE’S EDITORIAL “SUR L’IRIS DE L’ŒIL” .....	163
1.2 - LA HIRE’S EXPLANATION AND HIS EDITORIAL (1709).....	164
1.2.1 - LA HIRE’S LECTURE OF 20TH MARCH 1709: “EXPLICATION DE QUELQUES FAIT D’OPTIQUE” .....	164
1.2.2. - FONTENELLE’S EDITORIAL “SUR QUELQUES FAITS PARTICULIERS D’OPTIQUE” .....	168
1.3 - THE DEBATES AT THE FRENCH ACADEMY OF SCIENCE (1710 - 1712).....	169
1.3.1 - MÉRY’S THREE REPLIES .....	169
1.3 2 - FONTENELLE’S EDITORIAL “SUR L’EXPÉRIENCE DES YEUX DU CHAT PLONGÉ DANS L’EAU” .....	171
2 - DISCUSSION .....	173
2.1 - THE “MÉRY-LA HIRE CONTROVERSY” IN THE CONTEXT OF THE DEBATES OF THE ROYAL ACADEMY OF SCIENCES ON ‘GLAUCOMA’ AND CATARACT.....	173
2.2 - THE CONTRIBUTIONS AND ERRORS OF MÉRY AND LA HIRE.....	175
3 - MÉRY, LA HIRE AND THE NEUTRALIZATION OF CORNEAL DIOPTRIC POWER .....	177
4 - A SHORT HISTORICAL SURVEY OF THE CITATIONS, OMISSIONS, AND MISINTERPRETATIONS.....	178
4.1 - THE GAPS IN THE TREATISES ON CONTACT LENSES.....	178
4.2 - MÉRY, LA HIRE AND THE FIRST VISUALIZATION OF THE FUNDUS OF A LIVING EYE.....	179
APPENDIX 1	
TRANSCRIPTION OF JEAN MÉRY, “DES MOUVEMENTS DE L’IRIS ET PAR OCCASION DE LA PARTIE PRINCIPALE DE L’ORGANE DE LA VUE” (1704).....	183
APPENDIX 2	
TRANSCRIPTION OF FONTENELLE, “SUR L’IRIS DE L’OEIL” (1704).....	187
APPENDIX 3	
TRANSCRIPTION OF PHILIPPE DE LA HIRE, “EXPLICATION DE QUELQUES FAIT D’OPTIQUE ET DE LA MANIÈRE DONT SE FAIT LA VISION” 1709) ....	189
APPENDIX 4	
TRANSCRIPTION OF FONTENELLE, “SUR QUELQUES FAITS PARTICULIERS D’OPTIQUE” (1711).....	193
APPENDIX 5	
TRANSCRIPTION OF JEAN MÉRY, “RÉPONSE À LA 3E PARTIE DE LA CRITIQUE DE M. DE LA HIRE DU 20 MARS 1709” (1712).....	194
APPENDIX 6	
TRANSCRIPTION OF FONTENELLE, “SUR L’EXPÉRIENCE DES YEUX DU CHAT PLONGÉ DANS L’EAU” (1712) .....	201

<b>CHAPTER 6 : François Pourfour du Petit’s Neutralization of the Corneal Dioptric Power .....</b>	<b>203</b>
INTRODUCTION.....	205
1 - SOURCE DOCUMENTS .....	207
1.1 - PETIT’S MEMOIR: “DÉMONTRER QUE L’UVÉE EST PLANE CHEZ L’HOMME” (1728).....	207
1.1.1 - THE CRITIC OF THE CONVEXITY OF THE IRIS .....	207
1.1.2 - THE DEMONSTRATION OF THE FLATNESS OF THE IRIS BY MEANS OF THE CORNEAL NEUTRALIZATION BOX.....	209
1.2 - FONTENELLE’S EDITORIAL: “SUR LA STRUCTURE DES YEUX” .....	216
2 - DISCUSSION .....	217
2.1 - FRANÇOIS POURFOUR DU PETIT’S WORK IN THE CONTEXT OF THE DEBATES OF THE ACADEMY OF SCIENCES ON THE CRYSTALLINE LENS AND CATARACT OPERATION .....	217
2.2 - THE RATIONAL APPROACH TO CRYSTALLINE LENS TOPOGRAPHY .....	218
2.2.1 - WINSLOW’S OBSERVATIONS ON FROZEN EYES (1721).....	218
2.2.2 - PETIT’S OBSERVATIONS ON FROZEN EYES (1723).....	219
2.3 - PETIT’S LECTURES ON THE CATARACT OPERATION .....	221
2.3.1 - FIRST DISSERTATION ON THE CATARACT OPERATION (1725).....	221
2.3.2 - DESCRIPTION OF THE “CANAL GODRONNÉE” .....	223
2.3.3 - SECOND DISSERTATION ON THE CATARACT OPERATION (1726).....	224
2.3.4 - DEMONSTRATION OF THE PLANARITY OF THE HUMAN IRIS .....	224
2.3.5 - OPHTHALMOMETRIC MEASUREMENTS (1728).....	225
2.3.6 - THE FINAL SYNTHESIS (1730).....	228
3 - FRANÇOIS POURFOUR DU PETIT, CORNEAL DIOPTRIC POWER NEUTRALIZATION AND CONTACT LENSES.....	229
4 - SHORT HISTORY OF CITATIONS.....	231
APPENDIX 1	
TRANSCRIPTION OF FRANÇOIS POURFOUR DU PETIT, “DÉMONTRER QUE L’UVÉE EST PLANE CHEZ L’HOMME” (1728) .....	233
APPENDIX 2	
TRANSCRIPTION OF FONTENELLE, “SUR LA STRUCTURE DES YEUX” (1730) .....	235
<b>CHAPTER 7 : Corneal Immersion by Thomas Young .....</b>	<b>237</b>
INTRODUCTION.....	239
1 - SOURCE DOCUMENTS .....	241
1.1 - “ON THE MECHANISM OF THE EYE” (1800).....	241
1.1.1 - THE EXPERIMENTAL SET-UP.....	241
1.1.2 - PLATE III, FIGURE 13 AND HIS LEGEND.....	242
1.1.3 - NEUTRALIZATION OF THE DIOPTRIC POWER OF THE CORNEA AND POSTERIOR SURFACE OF THE MICROSCOPIC EYEPIECE .....	243
1.1.4 - MEASUREMENTS WITH AND WITHOUT ACCOMMODATION.....	245
1.1.5 - CRITIQUE OF THE METHODOLOGY .....	245
1.2 – VARIATIONS OF THE 1807 EDITION .....	245
2 – DISCUSSION.....	246
2.1 – THE EXPERIMENT ON NEUTRALIZATION OF CORNEAL DIOPTRIC POWER IN THE CONTEXT OF YOUNG’S LECTURE OF 27TH NOVEMBER 1800.....	246
2.1.1 - INNOVATIONS MADE BY YOUNG .....	247
2.1.2 - YOUNG’S OPTOMETER AND SCHEINER’S EXPERIMENT .....	247
2.1.3 - QUANTIFICATION OF ACCOMMODATION BY THE CRYSTALLINE LENS.....	248
2.1.4 - NEUTRALIZATION OF CORNEAL DIOPTRIC POWER.....	249
2.1.5 - MEASUREMENT OF OCULAR PARAMETERS .....	249
2.2 - INTERPRETATIONS OF THE NEUTRALIZATION OF CORNEAL DIOPTRIC POWER.....	250
2.2.1 - THE ‘TRADITIONAL’ INTERPRETATION .....	250
2.2.2 - OBJECTIONS TO THE ‘TRADITIONAL’ INTERPRETATION.....	251

3 - THOMAS YOUNG, NEUTRALIZATION OF CORNEAL DIOPTRIC POWER AND CONTACT LENSES.....	253
4 - SHORT HISTORY OF CITATIONS, OMISSIONS AND MISINTERPRETATIONS.....	254
4.1 - ROTATION OF FIGURE 13 .....	255
4.2 - YOUNG'S 'PRESBYOPIA'.....	255
4.3 - THE LENGTHENED CONTACT LENS .....	255
4.4 - THE LENS WOULD BE PLACED AGAINST THE CORNEA.....	256
4.5 - THE EXPLANATION FOR SOME MISINTERPRETATIONS .....	256

APPENDIX

TRANSCRIPTION OF THOMAS YOUNG, "ON THE MECHANISM OF THE EYE" (1801) .....	259
--	-----

**CHAPTER 8 : The Corneal Facsimiles of John Frederick William Herschel** ..... 261

INTRODUCTION.....	263
-------------------	-----

1 - SOURCE DOCUMENTS : THE PASSAGES IN THE 'ENCYCLOPAEDIA METROPOLITANA' ..... 265

1.1 - "MALCONFORMATIONS OF THE CORNEA" (PAGE 398, MARGINAL NUMBER 359).....	265
1.2 - "REMARKABLE CASE, SUCCESSFULLY REMEDIED BY GLASSES" (PAGE 398, MARGINAL NUMBER 359).....	266
1.3 - A METHOD OF CORRECTING AN IRREGULAR CORNEA USING AN INTAGLIO 'FACSIMILE' IMPRINT.....	267
1.4 - THE FOOTNOTE OF PAGE 398.....	267
1.5 -THE NEUTRALIZATION OF THE CORNEAL DIOPTRIC POWER OF FISH EYES (PAGE 400, MARGINAL NUMBER 368).....	268

2 - DISCUSSION ..... 269

2.1 - ANALYSIS OF HERSCHEL'S PUBLICATION .....	269
2.2 - HERSCHEL'S PUBLICATION IN THE CONTEXT OF THE KNOWLEDGE OF HIS ERA.....	270
2.2.1 - WILLIAM MACKENZIE .....	270
2.2.2 - NOTTINGHAM .....	271

3 - HERSCHEL, CORNEAL DIOPTRIC POWER NEUTRALIZATION AND CONTACT LENSES..... 272

4 - HISTORY OF AN ERRONEOUS ATTRIBUTION AND OF SOME MISINTERPRETATIONS..... 275

4.1 - THE FRENCH ATTRIBUTIONS (1893).....	275
4.2 - THE GERMAN ATTRIBUTIONS (1894, 1932).....	276
4.3 - LATER ATTRIBUTIONS .....	277

APPENDIX 1

TRANSCRIPTION OF JOHN FREDERIC WILLIAM HERSCHEL, "OF THE STRUCTURE OF THE EYE, AND OF VISION" .....	279
--	-----

APPENDIX 2

TRANSCRIPTION OF GEORGE BIDDEL AIRY, "ON A PECULIAR DEFECT IN THE EYE, AND A MODE OF CORRECTING IT" (1827) .....	281
---	-----

**CHAPTER 9 : The Era of Orthoscopes** ..... 283

INTRODUCTION.....	285
-------------------	-----

1 - SOURCE DOCUMENTS ..... 287

1.1 - CZERMAK'S ORTHOSCOPE (1851) .....	287
1.1.1 - REVIEW OF THE LAWS OF REFRACTION.....	287
1.1.2 - WHY IS THE IRIS SEEN AS VAULTED AND THE ANTERIOR CHAMBER FLATTER THAN IT REALLY IS ? .....	288
1.1.3 - THE PRINCIPLE OF NEUTRALIZATION OF CORNEAL DIOPTRIC POWER BY WATER .....	288
1.1.4 - CONSTRUCTION OF THE ORTHOSCOPE.....	289
1,1.5 - THE APPLICATIONS OF THE DEVICE .....	291
1.1.6 - EXAMINATION OF THE EYES THROUGH THE DEVICE.....	293
1.1.7 - THE DIVER'S VISION.....	294

1.1.8 - GIVING THE INSTRUMENT A SUITABLE NAME .....	296
1.2 - HASNER'S ADAPTATION FOR CLINICAL USE (1851).....	297
1.2.1 - APPLICATIONS FOR MEDICAL DIAGNOSIS .....	297
1.2.2 - THE WATER CONTACT WITH THE EYE UNDER EXAMINATION AND LEAKAGES.....	298
1.2.3- HASNER'S "WASSERWANNE".....	299
1.3 - ARLT'S GUTTA-PERCHA ORTHOSCOPE (1853).....	300
1.4 - NEUTRALIZATION OF CORNEAL REFRACTIVE POWER BY COCCIUS (1852, 1853).....	301
1.4.1 - THE CONTACT GLASS-PLATE .....	301
1.4 2 - THE ORTHOSCOPIC EYEBATH.....	302
1.5 - VAN TRIGHT AND THE SCHOOL OF DONDERS (1853) .....	304
1.6 - ZANDER'S DESCRIPTIONS (1859).....	305
1.7- THE WORKS AND THE PUBLICATIONS OF HELMHOLTZ (1867).....	306
1.8 - THE STUDY OF ACCOMMODATION BY WOINOW .....	308
1.9 - THE PHOTOGRAPHIC ORTHOSCOPES.....	309
1.9.1 - FICK'S PHOTOGRAPHIC "CONTACTBRILLE" (1891) .....	309
1.9.2 - THE PHOTOGRAPHIC "WASSERKAMMER" OF GERLOFF AND MEISSNER (1891).....	310
1.10 - OTHER USERS OF THE ORTHOSCOPE PRINCIPLE .....	313
1.10.1 - AT THE END OF THE 19TH CENTURY .....	313
1.10.2 - AT THE BEGINNING OF THE 20TH CENTURY .....	313
2 - DISCUSSION .....	315
2.1 - THE MODELS .....	315
2.1.1 - THE OPEN ORTHOSCOPE .....	315
2.1.2 - THE CLOSED ORTHOSCOPE .....	315
2.2 - TECHNICAL ASPECTS.....	315
2.3 - PHYSIOLOGICAL ASPECTS .....	316
2.3.1 - THE APPLICATIONS AND THE MAINTENANCE IN POSITION OF THE LIQUID .....	316
2.3.2 - THE QUALITY, COMPATIBILITY AND TOLERATION OF THE LIQUID.....	317
2.3.3 - OPTICAL ASPECTS.....	318
2.4 - THE APPLICATIONS OF THE ORTHOSCOPE.....	320
2.5 - TERMINOLOGY .....	320
2.6 - THE ORTHOSCOPES AND THE NEUTRALIZATION OF CORNEAL REFRACTIVE POWER.....	321
3 - A SHORT HISTORY OF CITATIONS, OMISSIONS AND MISINTERPRETATIONS .....	322
<b>BIOGRAPHICAL NOTICES .....</b>	<b>325</b>
<b>BIBLIOGRAPHY .....</b>	<b>345</b>
<b>NAME INDEX .....</b>	<b>361</b>

# Preface

Dear Reader,

Welcome to the first part of the History of Contact Lenses. In the course of the nine chapters of this first volume, I describe the History of the Early Neutralizations of the Corneal Dioptric Power.

It is essential to understand that the history of this preliminary step, to the extent that it is described in the historical introductions of classical contact lens treatises, does not always correspond with the thorough objective criteria of the historical sciences. In order to allow readers to make up their own minds; I felt it necessary to present the original description or basic texts, together with translations and critical analysis of these. I have positioned these documents in the context of their author's work and of the state of knowledge of the epoch in which they were written. A short citation of several of the most current contemporary interpretations, often with mistakes, anachronisms and ambiguities thereto pertaining closes each chapter.

Readers will also find interesting pearls of knowledge if they consult the transcriptions of the original versions of the pivotal texts contained in the appendix. Also, they should refer to the articles cited in the bibliography as well as deepening their knowledge of the biographical notices of the quoted names of this history.

This History of Contact Lenses is the result of a combination of three sets of circumstances:

- the historical and geographical privilege of living in Alsace, cradle of Rhenish humanism and beneficiary of both French and German culture. Every conflict between the European nations has left its mark, conquerors being forced, as soon as peace is restored, to construct libraries there and to enrich these with their best known works and archives,
- I have a passionate fondness for history, first of all for the history of my city and my region, secondly for medical history, which is the history of my profession. This passion resulted in my collecting documents relating to the history of contact lenses over a period exceeding thirty years, along with exploration of the various locales, presentation of papers at congresses, publications of articles and clarifications,
- finally, I have dedicated five years exclusively to research projects in libraries, archives, museums and collections with the aim of verifying documents (1). My first compilation of these researches took the form of a doctoral thesis in historical and philological sciences that was defended in Paris in January 2001.

This History of Contact Lenses would not have seen the light of day, had it not been for the collaboration of many different organizations and individuals to whom I am greatly indebted and to whom thanks are due :

- the directors of the many scientific societies and institutions who have allowed me to express my views within their walls and thus submit my opinions to their members and associates (2),
- The German publishing house Enke of Stuttgart for entrusting me with the journal editorship of Contactologia. This privilege permitted me to give voice to historical witnesses and to allow researchers to describe the results of their studies,
- The director of my doctoral thesis in historical and philological sciences as well as the pres-

ident and members of the jury for my thesis, whose advice helped me to a first version of this project,

- numerous enthusiasts of the history of ophthalmology, visual sciences, optics and contact lenses. Our discussions and exchanges, often passionate, sometimes almost confrontational, have permitted clarification of many a litigious point. The ties with colleagues produced by these encounters have often resulted in a deep friendship, linked by a mutual interest in historical research,

- the publisher Jean-Paul Wayenborgh, who believed in the interest of an in-depth publication, even encyclopedic, of The History of Contact Lenses and has put his resources, his warm personality and his enormous enthusiasm at my disposition as well as including this History in his prestigious series of Hirschberg's History of Ophthalmology,

- particular credit should be given to my translator, Colin Mailer FRCS (C) of London ON, Canada for his passionate interest in a job well done and who has not only used his considerable knowledge but has also made prodigious efforts to render as closely as possible the style and sense of the original text.

Editions Wayenborgh are committed to the publication of The History of Contact Lenses. In order that this process may continue, I appeal for the help and collaboration of all persons who are passionately interested in the history of contact lenses. I am making this appeal with particular regard to those chapters relating to the second half of the twentieth century. I appeal to the witnesses of this epoch and solicit the collaboration of those people responsible for making recent history. Only in this way will The History of Contact Lenses be able to fulfill the role the publisher has assigned, which is to provide a reference work for future generations.

I hope you really enjoy reading this volume!

Robert Heitz, M.D., Ph. D.,  
23 A, Rue Trubner  
F-67000 Strasbourg (France)

March 2003

*(1) It is a pleasure for me to thank the directors and staff members of the libraries, archives, museums and collections of the institutions which have both received me and welcomed me : Académie des Sciences/Paris, Bibliothèque Inter-Universitaire de Médecine/Paris, School of Optometry/Berkeley, CA, Clinique Ophtalmologique/Strasbourg, Faculté de Médecine et Faculté des Sciences de l'Université Louis Pasteur/Strasbourg, Bibliothèque Nationale/Paris, Bibliothèque Nationale et Universitaire/Strasbourg, Augenklinik der Universität Homburg/Saar, Zeiss Archiv/Jena, Deutsches Museum/Munich, Musée de la Médecine /Paris, Musée de l'Instrumentation Optique/Biesheim, Département d'Histoire des Sciences de la Vie et de la Santé, ULP/Strasbourg, and many others.*

*(2) European Contact Lens Society (ECLSO), Contact Lens Association of Ophthalmologists (CLAO), Société Française des Ophtalmologistes Adapteurs de Prothèses de Contact (SFOAPC), Arbeitsgruppe Kontaktlinsen des Berufsverband der Augenärzte Deutschlands (BVA), Société Belge des Verres de Contact (SOBEVECO), Cogan Ophthalmic History Society, Julius-Hirschberg-Gesellschaft für Geschichte der Augenheilkunde (JHG), Société Francophone d'Histoire de l'Ophtalmologie (SFHO), and many others.*

**PART 1**

**EARLY NEUTRALIZATIONS  
OF  
THE CORNEAL DIOPTRIC POWER**

