ON THE

MEANING OF THE WORDS NYCTALOPIA
AND HEMERALOPIA.

BY

JOHN TWEEDY

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1882.
ON THE MEANING OF THE WORDS "NYCTALOPIA" AND "XENEMELOPIA" AS DISCLOSED BY AN EXAMINATION OF THE DISEASES DESCRIBED UNDER THESE TERMS BY THE ANCIENT AND MODERN MEDICAL AUTHORS.

By John Tweedy, F.R.C.S.,

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Whatever view we may take of the nature of logic, whether, with Archbishop Whately, we regard it as entirely conversant about language; or, with Sir William Hamilton and Dean Mansel, as concerned with the acts and states of mind indicated by the words we use; or, with J. S. Mill, as dealing with the things concerning which we argue; or, lastly, with Mr. Stanley Jevons, as in a certain sense embracing all three, namely, language, thought, and objects,1 we must admit that language is one of the principal instruments of thought, and that any imperfection in it, or in the mode of employing it, is liable to confuse and impede the process of thought, and to destroy all ground of confidence in the result.2 Unless our language be at once accurate, precise, and unequivocal, it cannot be trusted as an instrument either of record or of communication.

In treating of the connexion between words and ideas, and of the fallacies, errors, and disputes arising from uncertain or mistaken significations of words, Locke says, "I am apt to imagine that, were the imperfections of language, as the instrument of knowledge, more thoroughly weighed, a great many controversies that make such a noise in the world would of themselves cease; and the way to knowledge, and perhaps peace too, lie a great deal opener than it does."3 This is especially true of the language of science, where words are

not only terms but definitions also. Hobbes defined a *name* as "a word taken at pleasure to serve for a mark, which may raise in our mind a thought like to some thought we had before, and which being pronounced to others, may be to them a sign of what thought the speaker had before in his mind." The convenience and necessity of preserving the signification of words untainted is obvious. If I write the word "conjunctivitis," or "iritis," or "cataract," or "myopia," the reader at once forms a sufficiently intelligible idea of what I mean. So also with "mydriasis:" the mention of this word forthwith calls up the idea of a fixed dilated pupil, though here and there, perhaps, might be found one who, entrenching himself behind the sole authority of Aretæus, would, pedantically, declare that the word called up in his mind the idea of "a pupil contracted to a small size." But what idea do I provoke when I employ the word "nyctalopia?" Nine persons out of ten, if they had the courage and confidence to avow it, would reply that they were not quite clear whether the term meant *night-blindness* or *night-sight*: though if pressed they would pronounce in favour of the latter. Nor would the answer seem unreasonable if we remembered that in all the best known published texts of Hippocrates, and in all the translations of this author, and in nearly every book written on Ophthalmology during the last century and a-half, the term "nyctalopia" is employed to denote the disease in which a person can see well by night and not by day. It is in this sense the word *nuktalōvps* is defined in the latest (6th) edition of Liddell and Scott's Greek-English Lexicon, on the one hand, and in the most recent and important treatise on modern Ophthalmology, on the other, as well as in nearly every known scientific and medical lexicon, including that of

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3 Graefe und Saemisch: "Handbuch der Gesammt. Augenheilkunde."
THE WORDS NYCTALOPIA AND HEMERALOPIA.

Blancard, Kühn, and the scholarly production of Littré and Robin. In spite of this remarkable consensus of opinion among modern authorities regarding the meaning of the word nyctalopia, it can be shown that according to the authority of the best classical writers, and according to the etymological construction of the word, the real meaning of the term nyctalopia is night-blindness; and consequently, that the meaning of the opposite term hemeralopia is day-blindness, and not night-blindness, as modern writers assert.

I have already mentioned the circumstances that led me to revive the discussion on the meaning of the words nyctalopia and hemeralopia. The last number of these Reports contains a letter kindly and promptly written at my suggestion by Dr. W. A. Greenhill, the learned editor of Theophilus, of Celsus, and of Sydenham, and giving the results of a critical examination of the use of these words in the ancient Greek and Latin authors. The evidence adduced by Dr. Greenhill is conclusive. Henceforth, no one can defend the use of the word hemeralopia for night-blindness, and nyctalopia for day-blindness on philological or literary grounds. Dr. Greenhill has explained how the confusion arose. According to the ordinary texts of the Hippocratic writings, "nyctalopes" are said to be "those who see at night," whereas, for the reasons stated at p. 287, note 3, the original definition almost certainly was "those who do not see at night." This conjecture Dr. Greenhill defends with great ingenuity and learning. His position may, I believe, be further strengthened by comparing the clinical and pathological affinities of the nyctalopic affection described in the Hippocratic writings and the night-blindness of subsequent authors.

4 Prefatory Note to Dr. Greenhill's letter "On the meaning of the words 'Nyctalopia' and 'Hemeralopia,'" published in the last number of these Reports, p. 284.
It is this latter task I wish more particularly to attempt in this article.¹

Many reasons might be assigned for believing the true meaning of the word nyctalopia to be night-blindness, and not night-sight. The principal ones are seven in number, and may be briefly expressed thus:

1. All the ancient Greek medical writers, with the questionable exception of Hippocrates, and nearly all the Latin medical authors down to the end of the fourteenth century, as well as all other authors down to the middle of the seventeenth century, who define the term nyctalopia, use it in the sense of night-blindness.

2. As a symptom night-blindness is more frequent, more obtrusive, and more characteristic than night-sight. Indeed most, if not all, of the alleged cases of the latter are instances of dread of light,—photophobia, or heliophobia (Demours),—due to inflammation of some of the tunics of the eyeball, rather than of blindness by day and sight by night.

3. As an amaurotic state or condition night-blindness, whether it occur sporadically, or endemically, or epidemically, is comparatively frequent, and has been recognized in all ages, while the opposite condition of true night-sight is extremely rare, if not altogether unknown.

4. Even as regards the nyctalopic affections mentioned in the Hippocratic writings, there is almost conclusive evidence that they are essentially the same as those described by Aristotle and other writers as night-blindness. Most of the associated and predisposing conditions are the same, and many of the alleged concomitants are clearly those of night-blindness.

¹ It should perhaps be mentioned that this article was originally written to appear in conjunction with Dr. Greenhill’s letter. It was, however, found on comparing them in print, that they travelled over much of the same ground, though for different purposes. It was, therefore, decided to publish Dr. Greenhill’s letter first and independently, in order to keep the philosophical and the pathological arguments distinct and separate. In the interval I have taken the opportunity to revise and extend some portions of my article.
5. There is excellent manuscript authority that the writer of the second book of the Hippocratic treatise, named Prorrhetics, did actually state that persons who do not see at night are called nyctalopes.

6. If the term nyctalopia do not denote night-blindness, then we are compelled to conclude either that Hippocrates failed to recognize the affection; or, if he did recognize it, he did not deem it necessary to describe it or even to mention its special name.\(^1\)

7. If the term nyctalopia originally meant night-sight, then we must conceive the philological absurdity of describing by a word having reference to night \((\nu\varepsilon\varepsilon)\), a pathological state or condition characterized by an inability to see during the \textit{day}.

If these reasons be considered more closely, their force may perhaps become more apparent.

(1). The term nyctalopia is used to denote night-blindness by every one of the best Greek medical writers from Aristotle to Joannes Actuarius. It is used in this sense also by Pliny in the first century; by Paré, Guillemeau, Schenk, and Forrest in the sixteenth; and by Riolan, Ettmüller, and others in the seventeenth century.

A glance at Table I will show that of all the authors whose writings are quoted, to the middle of the seventeenth century, only one, namely Hippocrates,\(^2\) may be cited as using the term nyctalopia in the sense of \textit{night-sight}. It is true that some confusion of meaning seems to have existed in the time of Aëtius\(^3\)

\(^1\) It should be remembered that the term \textit{hemeralopia}, now used to denote night-blindness, was not known to the ancient authors; \textit{see} Dr. Greenhill’s letter, p. 284.

\(^2\) \textit{Prorrhet.}, ii.

\(^3\) Tetra. ii, serm. iii, c. xlvi. Though Aëtius describes nyctalopes as persons who see well by day and nothing at all by night, he also states that it happens to some \((\text{nyctalopes?})\) that they see \textit{better} by night than by day, adding that this is rare. It may be that in the latter instance Aëtius is really referring not to nyctalopes but to hemeralopes, without using the term. The passage is, however, taken in the sense of nyctalopes, by the Paris editors of Stephanus’ \textit{Thesaurus}; by Foësius, in his edition of Hippocrates, see. ii, p. 91 (Francof., 1595), and by Plempius, \textit{Ophthalmographia.}
in the fifth century, but Plempius,\(^1\) in the seventeenth
century, is one of the first writers who distinctly states that
the term nyctalopia bears the double signification of night-
sight (Hippocrates) and of night-blindness (Aëtius, Actuarius,
and Paulus Aegineta). Plempius himself evidently inclines
to the opinion that the former is the more correct, since
he says, “Unde et Celsus non recte Hippocratis sententiam
nocturnae cæcitati accommodat.”\(^2\) Celsus,\(^3\) it may be
remarked, described night-blindness under the term “imbe-
cillitas oculorum.”

In the accompanying Table (I) only those authors are
named who actually define the term nyctalopia or its cognates.

**Table I.**

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<tr>
<td>Hippocrates (?)(^4)</td>
<td>Aristotle,(^5)</td>
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<td>Pliny,(^6)</td>
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<td>Galen,(^7)</td>
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<td>Oribasius,(^8)</td>
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<td>Aëtius,(^9)</td>
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<td>Alexander Trallianus,(^10)</td>
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<td></td>
<td>Paulus Aegineta,(^11)</td>
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<td></td>
<td>Joannes Actuarius,(^1)</td>
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\(^1\) “Ophthalmographia,” 3rd ed.: Louvani, 1659; lib. v, c. xxvi, p. 232b.
\(^3\) Lib. vi, c. vi, sec. 38.
\(^4\) “Prorrhet.,” ii.
\(^5\) “De Generat. Animal.,” lib. v, c. i.
\(^8\) See also Dr. Greenhill’s letter, p. 285, note 4.
\(^9\) “Synops.,” viii, 46: “De loc. affect. curat. ad Eunap.,” iv, 18.
\(^10\) “De Arte Medica,” lib. ii, c. vi.
\(^11\) “De Re Medica,” lib. iii, c. xxii: “De Nyctalope.”
\(^12\) “Med. sive de Method. Medendi,” lib. iv, c. xi; ibid., lib. ii, c. vii, γυντ.λωπας λαμπνως.
THE WORDS NYCTALOPIA AND HEMERALOPIA.

NYCTALOPIA—continued.

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<td>(16th Century).</td>
<td>(16th Century).</td>
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<tr>
<td>Paré.</td>
<td>Guillemeau.</td>
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<td>Guillemeau.</td>
<td>Forestus.</td>
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<td>Forestus.</td>
<td>Sehenius.</td>
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<td>Sehenius.</td>
<td>(17th Century).</td>
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<td>(17th Century).</td>
<td>Riolan.</td>
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<td>Riolan.</td>
<td>Hoefer.</td>
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<td>Hoefer.</td>
<td>Ettmuller.</td>
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<td>Ettmuller.</td>
<td>Plempius (?)</td>
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<td>Plempius (?)</td>
<td>Plempius.</td>
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Plempius.®

It would therefore appear, that, with the possible exception of Hippocrates, and the unknown writer of the Galenic work, "Introductio, seu Medicus," no author of repute used the term nyctalopia to denote night-sight or day-blindness, before the seventeenth century. Even Plempius does not limit the term to night-sight; he rather speaks of two forms of nyctalopiasis, in one of which the patient cannot see well by night, in the other he cannot see well by day.

After the seventeenth century a very remarkable change occurs. The term nyctalopia loses the signification it has hitherto possessed, and gradually takes on that of night-sight, while the term hemeralopia is come into use to denote night-blindness. It is difficult to account for this change of meaning.

2 "Traité des Maladies de l’Œil ;" Paris, 1585, p. 27.
3 "De Morbis Oculorum," 1591, or "Observat. et Curat. Medie. ;" Francof, 1692, lib. xi, obs. xxxviii.
6 "Heroules Medieus ;" Noriberg, 1675, lib. i, e. viii.
7 "Opera omnia ;" Francof., 1688, "De Visus laesionibus," p. 475.
The term hemeralopia (except in the "Introd. seu Med.") is seldom to be met with in medical writings before the eighteenth century, though it is evident from the descriptions given by Paré, and especially by Guillemeau, that the term was not unfamiliar in their time.

Paré (circa 1578) says: "Acies nocturna: quand on void mieux de nuit que de jour, et se peut dire Hemeralopia en grec, Æil de chat en francois;" and Guillemeau, writing in 1585, speaks of "aveuglement de jour, dict en Grec Ημεραλωπία." Plempius, seventy-four years later, does not mention the term hemeralopia at all, though he discusses the problem "Cur nonnullorum oculi noctu sunt perspicaces, interdiu hebetiores?"

With the eighteenth century, the term hemeralopia comes into frequent use, and almost invariably bears the meaning of night-blindness, instead of day-blindness as heretofore; while the meaning of the term nyctalopia, on the other hand, in its turn, is, as I have said, transferred from night-blindness to day-blindness. Maitre-Jan as well as Bergen and Weise continue to employ nyctalopia as equivalent to night-blindness or day-sight, but Boerhaave, Guerin, and Sauvages use the word hemeralopia to denote this condition, while they apply the term nyctalopia to a confessedly rare condition of night-sight. The probable explanation of this extraordinary alteration, is that before the sixteenth century the works of Hippocrates were not accessible, and were consequently rarely consulted. Galen was the chief authority for the later Greeks and Romans, as well as for the Arabians; and though Hippocrates was held in high esteem by the ancient Greek and Latin physicians, he was not much studied during the Middle Ages. Galen had defined the Hippocratic term "nyctalopes" as those who are blind at night, and his definition was unquestioned till greater facilities occurred for

1 Loc. cit.
consulting the Hippocratic treatises in the original. In the sixteenth century Mercurialis (1588) and Foésius (1595) published their editions of the Hippocratic writings, and in the seventeenth century Vander Linden's edition appeared (1665). From this time more attention was given to the Hippocratic writings, and in the seventeenth and eighteenth centuries medical authors appealed to them in the original.

In all these editions the reading of the passage in the second book of the Prorrhetics is: "Οἱ δὲ τὴν νυκτὸς ὀρῶντες, οὖς δὴ νυκτάλωπας καλέομεν. κ.τ.λ." "Those who see at night, whom we call nyctalopes, etc." Hence those who consulted the Hippocratic writings would naturally conclude that they had discovered an error in the commonly accepted meaning of the term nyctalopia, and that the term really meant night-sight, and not night-blindness, as Pliny, Galen, Aëtius, Paulus Aegineta, and others had supposed.

This reading is still generally accepted as authentic. Even Littré did not think it necessary to alter it, though he mentions that its accuracy had been impugned by Coray. In some other quarters, however, the reading has been blindly accepted without any suspicion of doubt or difficulty. The late Sir William Lawrence, for example, was not content merely to accept the common reading of the Hippocratic text, but in order to justify the use of the word hemeralopia to denote night-blindness, actually states, "Hippocrates uses the term hemeralopia to denote night-blindness, and we may as well follow his example," whereas Hippocrates does not use the term hemeralopia at all.

An examination of Table II will show how completely writers have turned about since the seventeenth century.

1 See further on this question Dr. Greenhill's articles on Galen and Hippocrates in Smith's "Dict. of Greek and Roman Biography and Mythology," vol. ii, pp. 210 and 435.


**Table II.**

**NIGHT-BLINDNESS.**

<table>
<thead>
<tr>
<th>Nyctalopia.</th>
<th>Hemeralopia.</th>
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<tr>
<td>(18th Century).</td>
<td>(18th Century).</td>
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<tr>
<td>Maitre-Jan.¹</td>
<td>Boerhaave.⁴</td>
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<tr>
<td>Bergen and Weise.²</td>
<td>Guerin.⁵</td>
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<td>Sauvages.⁶</td>
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<td>Grant.³</td>
<td>De Wenzel.⁷</td>
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<td>Bampfield.⁸</td>
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<td>Demours.⁹</td>
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<td>Simpson.¹⁰</td>
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<td>Mason Good.¹¹</td>
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<td>Scarpa.¹²</td>
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<td>De la Rue.¹³</td>
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<td>Wardrop.¹⁴</td>
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</table>

¹ "Traité des Maladies de l'Œil:" Troyes, 1707; p. 271.
² "De Nyctalopia seu Cæcitate Nocturna." Haller, "Disput. ad Morb."
³ p. 359; Franc., 1754.
⁴ "De Morbis Oculorum ;" ed. Gotting: Gottinge, 1750; p. 159.
⁵ "Essai sur les Maladies des Yeux:" Lyon, 1769, p. 289.
⁶ "Nosologia Methodica Oculorum." Selected and translated by George
⁸ "A Practical Essay on Hemeralopia, or Night-blindness," read Dec. 7th,
¹⁰ "Observations on Hemeralopia or Nocturnal Blindness:" Glasgow,
    1819.
¹¹ "A Physiological System of Nosology:" London, 1820; p. lxix, and
    pp. 200-1.
¹² "Saggio di Osservazioni o d'esperienze sulle Principali Malattie degli
    Occhi:" Pavia, 1801, p. 251 ; or the French translation by M.M. Fournier-
    Pesay et Bégirin : Paris, 1821; vol. ii, p. 318 ; or the English translation by
### Nyctalopia.

(19th Century)—continued.

<table>
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<th>Author</th>
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<tr>
<td>Copland.</td>
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<td>Power.</td>
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### Hemeralopia.

(19th Century)—continued.

<table>
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<th>Author</th>
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<td>Middlemore.</td>
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<td>Tyrrell.</td>
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<td>Hull.</td>
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<td>Vidal (de Cassis).</td>
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<td>Chelius.</td>
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<td>Lawrenee.</td>
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<td>Desmarres.</td>
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<td>Forbes.</td>
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<td>Fabre.</td>
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<td>Mayne.</td>
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<td>Deval.</td>
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<td>Costello.</td>
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<td>Stellway von Carion.</td>
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<td>Soelberg Wells.</td>
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<td>Seitz and Zehender</td>
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<td>De Wecker.</td>
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<td>Galezowski.</td>
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<td>Tetzer.</td>
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<td>Schweigger.</td>
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<td>Maenamara.</td>
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<td>Lawson.</td>
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2 "Diseases of the Eye;" London, 1868; p. 453.
6 "Traité de Pathologie externe," etc.: Paris, 1840; vol. iii, p. 188.
7 "Handbuch der Augenheilkunde;" Stuttgart, 1843; vol. i, p. 358.
9 "Traité des Maladies des Yeux;" Paris, 1847; p. 696.
11 "Bibliothèque du Médecin-Praticien;" Paris, 1849; vol. x, p. 100.
12 "An Expository Lexicon;" London, 1860

It is not necessary to give detailed references to the writings of the following authors, as their works are well known and in general use.

15 "Diseases and Injuries of the Eye;" 3rd ed.: London. In the fourth edition, 1880, Mr. Lawson, at my suggestion, substituted the term nyctalopia for hemeralopia, to denote night-blindness.
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NIGHT-BLINDNESS—continued.

<table>
<thead>
<tr>
<th>Nyctalopia.</th>
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<td>(19th Century)—continued.</td>
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<td>Bader.</td>
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<td>Arlt.</td>
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<td>Hersing.</td>
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<td>Et alii.</td>
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Had the classification adopted in Table I been continued, it would have been found that nearly every author of the eighteenth and nineteenth centuries had been cited as using nyctalopia in the sense of night-sight. As no useful purpose would have been served by continuing such a classification, I have, in the second table, adopted another plan, namely, to arrange the authors of the eighteenth and nineteenth centuries according as they use the word nyctalopia or hemeralopia to denote night-blindness.

The general agreement among modern authors in using hemeralopia to denote night-blindness is startling, and might be held to be a sufficient reason for abstaining from any attempt to disturb the acquired status quo or to recover the original synonym. Even Dr. Copland, who uses the word nyctalopia in the sense of night-blindness, does so on inadequate and unsatisfactory grounds; and Mr. Power confessedly merely copies, without criticism or comment, the definition given in Copland's dictionary. Consequently, we are compelled to fall back upon Dr. Grant as one of the very few authors of the nineteenth century who deliberately use the term nyctalopia in the sense of night-blindness. Even he does not advance any specific justification of such a choice; and the advantage of his decision is minimised by the course taken by Dr. Forbes, the principal editor of the "Cyclopaedia of Practical Medicine," in ignoring Dr. Grant's opinion, and adopting the opposite meaning in the Select Medical Bibliography appended to the fourth volume of this work.

The results of this examination and comparison of ancient and modern writers may, therefore, be thus summarized:
Up to the end of the fifteenth century writers are almost unanimous in using the word nyctalopia to denote night-blindness. The latter half of the seventeenth century is a period of transition. From the beginning of the eighteenth century onwards writers use the word hemeralopia in the sense of night-blindness, and nyctalopia for day-blindness.

(2). As a symptom night-blindness is more frequent, more obtrusive, and more characteristic than night-sight. Every ophthalmic surgeon is familiar with night-blindness and of its causes. In some cases of keratitis, of iritis, and of choroiditis, there is more or less photophobia, so that vision is somewhat better when the eyes are shaded or when the light is dull. Most albinos too see better in a dim light; and whenever there is a small central opacity of the cornea or crystalline lens, vision is better in a dull than in a bright light, because then the pupil dilates, and rays of light pass through the clear margin of the cornea or lens. This is one of the forms of visus nocturnus of Boerhaave, which he regards as identical with the nyctalopia of Hippocrates. The true nature of this form of night-sight is easily recognized, and in the strict sense of the term there is neither blindness by day nor sight by night. A similar criticism may apply to some of the instances referred to by Pliny, Plater, Rhodiginus, Plempius, Briggs, Boyle, Willis, Schenkius, Porterfield, and others, of persons possessing the power of seeing and even reading in the dusk or dark. So far as these accounts are trustworthy, they merely show that some persons may possess or acquire a degree of visual power enabling them to distinguish objects in an imperfect illumination. In the year 1867, Dr. Arlt, of Vienna, described

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1 *Op. cit.*, pp. 137 and 162: Probably the high authority of Boerhaave was the chief factor in establishing the change of meaning of nyctalopia.

2 "Der Bericht ueber die Augenklinik," 1867. See also American translation by Dr. Weightman: Philadelphia, 1868.
a form of retinitis which he designated Retinitis nyctalopica, in which, during the day, all objects appear to be covered by a silvery fog or haze, which is not noticeable at dusk. This form of retinitis does not, however, materially affect the present question.

(3). It is scarcely necessary to bring forward any special testimony as to the occurrence of night-blindness as an amaurotic affection. It is known to occur sporadically, or as an epidemic, or to prevail endemically in certain localities. The opposite condition of night-sight is probably unknown as an amaurotic condition.

It is a matter of common knowledge that night-blindness as an amaurotic affection is still prevalent in certain localities. On the other hand, it is doubtful whether any amaurotic condition is known in which the eyes are blind during the day, but possess the power of seeing at twilight or in the dark. Ramazzini\(^1\) has alleged, that about the spring of the year he frequently met with young persons who were unable to see during the day, but who could see when night came on again. In about a month they recovered. These observations have not, however, been confirmed by other competent observers. Demours,\(^2\) Middlemore,\(^3\) Tyrrell,\(^4\) Lawrence,\(^5\) Maekenzie,\(^6\) and most other authors, either deny the existence of such a disease, or assert it to be of extremely rare occurrence. The cases quoted by Mettrie,\(^7\) Lassus,\(^8\) Hillary,\(^9\) Pye,\(^10\) M. Guthrie,\(^11\)

\(^6\) "Institutions de Medicine de Boerhaave, avec un Commentaire," 2nd ed.: Paris, 1747; tome iv, pp. 431, 432.
\(^7\) "Pathologische Chirurgica," 1805–6; tome ii, p. 539, et seq.
\(^9\) Ibid.
\(^10\) Ibid.
Larrey,\(^1\) Isbell,\(^2\) and others will not enable us to form a category of diseases characterised by night-sight or day-blindness, in the same manner as we may form a category of diseases characterised by night-blindness. The predominating symptom in most, if not all the cases mentioned is, as I have already stated, dread of light, or photophobia. I have often seen persons engaged in out-door occupations who were thought to be suffering from day-blindness. They could see fairly well in the twilight, but were unable to get about during the day in bright sun-light. In every instance I found either a small vascular ulcer or other affection of the cornea, or some form of chronic conjunctivitis. The symptom was, therefore, photophobia, due to inflammation, and not amaurotic.

(4). A comparison of the meagre accounts given in Hippocrates of the condition of the persons designated "nyctalopes," and the fuller descriptions of night-blindness by later authors will, I believe, lead inevitably to the conclusion that the nyctalopes of Hippocrates are the same as the night-blind individuals of later authors; and, hence, that Hippocrates, or the writer of the second book of the Proorhethics, intended to say that persons not seeing at night are called nyctalopes. This comparison of Hippocrates with the later authors applies not only to the definition of nyctalopia, but also to the description of the disease, to its course, its etiology, and its treatment.\(^3\)

The predisposing and indisposing conditions, the concomitants, and other peculiarities of Hippocrates' nyctalopia, may be briefly enumerated as follows:—

(a) It chiefly occurs in children, and young adults.\(^4\)

\(^1\) "Mémoires de Chirurgie Militaire;" tome i, p. 6 : 1812.


\(^3\) It should be borne in mind that though Hippocrates is usually spoken of as the author of the works cited in this article, the best critics do not, for other reasons, believe that any of the treatises containing references to nyctalopia were really written by him.

\(^4\) "Epid.," vii, sec. 7; "Prorrhet.," ii.
(b) Dark eyes, and eyes with small pupils are predisposed to it.¹

(e) Married women and virgins whose menses are regular are not subject to it.²

(d) Eruptions appear about the ears on the seventh or eighth day.³

(e) The formation of abscesses, and spontaneous diarrhoea are favourable prognostics.⁴

(f) The treatment consists of bleeding, purging, cupping, and the ingestion of ox's liver steeped in honey.⁵

(g) The disease is sometimes complicated by swelling of the gums, toothache, foul breath, swelling below the eyes, bleeding from the nose, ulcers on the legs, and enlarged spleen.⁶

All these circumstances and peculiarities are, separately or combinedly, mentioned by other authors as pertaining to night-blindness.⁷

Age.—It is commonly assumed that Hippocratic nyctalopia is a disease of childhood. M. Sichel, in the introduction to his translation of the treatise Περὶ ὑποτήλων, published in Littré's edition of Hippocrates,⁸ contends that the disease designated nyctalopia, and described in the second book of the Prorrhetics, corresponds exactly with the scrofulous and some of the epidemic ophthalmiee of children. This assumption is not justified by the text, νεοῖ, ἦ παιδεῖς ἦ νεανίσκοι. The term νεοῖ applies not only to children, but to men at least as old as thirty,⁹ and the term νεανίσκοι certainly

¹ "Epid.,” vi, sec. 7.
² "Prorrhet.,” ii.
³ "Epid.,” iv.
⁴ "Prorrhet.,” ii.
⁵ "De Visu."
⁶ "Prorrhet.,” ii.
⁷ It is not now the question whether these allusions are true or not. They are merely cited as illustrating the opinions of the various authors respecting night-blindness, and as showing that they ascribed to night-blindness the same qualities as those said to belong to nyctalopia.
⁸ Tome ix, p. 122, et seq.
⁹ See Liddell and Scott's Greek Lexicon, νέος and νεανίσκος.
includes men old enough to engage in battle, and to marry.¹

The disease may, therefore, be said to occur not only in children (παιδες), but also in young adults up to the age of forty. Moreover, the statement, presently to be discussed, that married women are not subject to the complaint, also implies that the disease is not exclusively one of childhood.

Colour of the eyes, etc.—Dark eyes and eyes with small pupils are said to be especially predisposed to Hippocratic nyctalopia.² Aristotle and other authors state these eyes show a similar predisposition to night-blindness.

In treating of some of the causes of the difference in colour of the eyes of different individuals, Aristotle remarks that it had been assumed, on insufficient grounds, that pale blue eyes (γλαυκόμματα) have more of fire, as Empedocles had said, and dark eyes (μελανόμματα) more of water than of fire; adding that it had been incorrectly stated that lack of moisture is the reason why blue eyes cannot see well by day, as want of fire is the reason why black eyes cannot see well by night.³ In opposition to this view Aristotle asserts, with Democritus, that in every case vision is of water, and not of fire.⁴ The eye is made of water, because this is transparent; and the amount of fluid (τὸ ὑγρόν) in the eye determines the colour of the eye. Eyes that have much moisture are dark, and those that have little are blue. This is the reason why blue eyes cannot see well by day, or black eyes by night; because blue eyes, on account of the scarcity of their moisture, are too much agitated by the light, whereas black eyes, from an excess of moisture, are not so easily set in motion.⁵ Moreover, nocturnal light is very feeble, and does

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¹ Herodt. iv, 72, 112, 114 and 115.
² “Epid.,” vi, sec. vii, 1.
³ “De Generat. Animal.,” lib. v, c. i.
⁴ Ib. ; and “ De Sensu,” c. ii.
⁵ Aristotle's theory of vision was that visible objects set in motion a transparent medium between them and the eye, and that this motion is, in its turn, communicated to the sense-organ. “ De Anima.,” lib. ii, c. vii; “ De Sensu,” c. ii and iii; “ De Generat. Animal.,” lib. v, c. i.
not excite sufficiently the copious fluids of the dark eyes. Corresponding differences are, he continues, to be observed in the kind of diseases that affect blue eyes and dark eyes respectively. Cataract (γλαυκωμα) occurs in blue eyes, and "nyctalopia" in dark eyes. Cataract being a dryness of eyes, chiefly affects old people, but nyctalopia being due to a superabundance of moisture occurs in those who are younger (τοῖς νεώτεροις). Similarly, Levinus Lemnius, though he does not use the term nyctalopia, says that dark eyes may be of such condition that they see acutely during the day, but badly and less clearly at night. (Noctu vero obtuse minusque acute videndi muncere funguntur.)

The size of the pupils.—Both Plempius and Boerhaave describe the connexion between night-blindness and narrowing of the pupil. Indeed, both these writers ascribe night-blindness to contraction and non-dilatability of the pupil rather than to thickening and opacity of the tunics and humours of the eye, as Aëtius had supposed; "Quia in nyctalopia seu cæitudine nocturna vesperi ægri non vident, sic tamen, ut die sat recte cernant; at qui crassas tunicas humoresque sortiti sunt, ne quidem die res probe intuentur." According to Boerhaave the power of seeing at night is determined by the degree of dilatability of the pupil, and the reason why horses see better than men in the dark, is that horses have larger pupils, and hence more light can enter their eyes, but if the pupil do not dilate then they cannot see at night.  

The Immunity of Women.—Hippocrates states that married women and virgins who have the menstrual discharge

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1 Not necessarily young children, but men of military age. Thucyd., v, 50. See Liddell and Scott. νεώτεροις.
2 "De Miraculis Occult. Naturæ." Francof., 1604; lib. iv, c. vi, p. 375.
5 Tetr., ii; serm. iii, c. xlvi.
6 Plempius, loc. cit.
THE WORDS NYCTALOPIA AND HEMERALOPIA.

regular are not subject to nyctalopia.\(^1\) Celsus long after claimed for them a similar freedom from *night-blindness*:—

"Præter hæc, imbecillitas oculorum est, ex qua quidam interdiiu satis, noctu nihil cernunt; quod in fæminam bene respondentibus menstruis non cadit."\(^2\) It will, I imagine, scarcely be contended that Celsus and the writer of the Hippocratic treatise are speaking of exactly opposite diseases, *night-blindness* and *night-sight* respectively. Exemptions so peculiar can only apply to similar diseases. The freedom from night-blindness of women in whom the catamenia are regular is mentioned by many other ancient Greek and Latin authors, though this alleged immunity has not been confirmed by modern authors, except that women are less exposed to the conditions which tend to induce night-blindness. In an epidemic of night-blindness which occurred in the district of Mausanne, it was noted by Fleury and Frechier\(^3\) that *pregnant* women were most affected with it, though no age or sex was spared.\(^4\)

*The appearance of eruptions about the ears,*\(^5\) and the *supervention of abscesses and diarrhoea,*\(^6\) are regarded as favourable prognostics in the Hippocratic nyctalopia. Though Bampfield, to whom we are indebted for the most trustworthy modern account of night-blindness, states that he could not perceive "that any particular constitutions or ages, or eyes of any particular description, form, or colour," were particularly subject to night-blindness;\(^7\) he did find "a

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2 "De Medicina," lib. vi, c. vi.
4 See also Dr. Grant's article, "Nyctalopia," in "Cyclop. of Prat. Med.,” vol. iii, pp. 184, 185.
5 "Epid.,” iv.
6 Prorrhet., ii.
spontaneous cure has sometimes succeeded to the eruption of boils on the face or head, and to the formation of abscesses of the face, head, or ears.™ He also asserts that in cases of night-blindness associated with scurvy, "after a fresh animal and vegetable food has been instituted and persevered in for a short time, and the scurbutic diathesis is corrected, if a lax state of the bowels is not induced by the change of diet, as is usually the case, I have frequently directed cathartics;" adding that, though he had never administered cathartics without employing local treatment, he had, in several cases, observed so prompt a recovery from the combination, "that I have been induced to ascribe much of the benefit obtained to their use."™

The Treatment.—Perhaps the strongest argument that can be advanced in support of the opinion that the nyctalopia of Hippocrates, and that of the later Greek and Latin authors are the same, is the remarkable similarity in the reputed remedies. This is especially noticeable with regard to the local application of the bile or the sanies of liver, and to the ingestion of raw or roasted liver. The writer of the Hippocratic treatise "De Visu" recommends an ox’s liver, but other writers seem to prefer that of the goat or the sheep. Galen, Celsus, and Pliny also mention and recommend this mode of treatment; indeed Pliny enters upon a long and detailed explanation of the modus operandi of goat’s liver in curing persons who cannot see by night (nyetalopas a Græcis dictos).™ Goat’s or sheep’s liver, or the liver of some other animal, is also recommended by Oribasius,4 Marcellus,5 Aëtius,6 Alexander Trallianus,7 Paulus Aegineta,8 and Actuarius.9

3 "Hist. Nat.," lib. xxvii, c. 47. See, further, Dr. Greenhill’s letter, p. 285, notes 4 and 5.
4 "De loc. Affect. cur.;" lib. iv, c. 18.
5 "De Medicamentis," cap. viii.
6 Tetr. ii, serm. iii, c. xlvi.
7 "De Arte Med.," lib. ii, c. vi.
8 Lib. iii, c. xxii.
9 "Med. sive Meth. Med.," lib. iv, c. xi.
Guillemeau\textsuperscript{1} refers to it, and Scarpa,\textsuperscript{2} citing Dupont,\textsuperscript{3} also mentions it. Adams, in his commentary on Paulus Aegineta,\textsuperscript{4} states that Rhases, Avicennna, Mesue, Jesu Haly, Haly Abbas, and Alsaharavius also speak favourably of the application of the roasted liver in cases of night-blindness.

Even in recent times the hepatic treatment of night-blindness has been employed. Dr. Grant\textsuperscript{5} quotes the experience of Dr. Meissener, and states that he himself “has repeatedly seen a cure apparently produced by fumigating the eyes with the vapour of a bullock’s liver,” though he does not believe that there is any specific virtue in the liver.

The concomitants of Hippocratic nyctalopia are swelling of the gums, toothache, foul breath, swellings below the eyes, bleeding from the nose, enlarged spleen, and ulcers on the legs.\textsuperscript{6} I need scarcely say that this train of symptoms indicates the condition now called Scorbutus, of which night-blindness is a well-known symptom. The account given by Hippocrates may not be a perfectly accurate description of scorbutus in all its parts, but it is sufficiently correct to enable us to identify it. Van Swieten pertinently remarks: “Although it cannot be denied but the ancient physicians have reckoned up many of the symptoms of the scurvy in their descriptions of several distempers, handed down to us under a different denomination; yet it is not so apparent that they have seen into the real nature of the distemper itself, nor so plainly described the symptoms of it, that one may be able from them to gather a full knowledge of the scurvy.”\textsuperscript{7} Of the accounts given in the Hippocratic writings, he remarks, “though he [Hippocrates] mentions a great many symptoms of the scurvy, seems not to have judged that

\textsuperscript{1} Op. cit., pp. 27, 28.
\textsuperscript{3} “Mémoire sur la goutte sereine nocturne épidémique, ou Nyctalopie.”
\textsuperscript{4} Book iii, sec. 22; Syd. Soc. ed.; vol. i, p. 434.
\textsuperscript{5} Op. cit.
\textsuperscript{6} “Prorrhet.,” ii.
\textsuperscript{7} “Comment in Hermanni Boerhaave Aphorism :” Lug. Bat., 1753, t. iii, p. 500; or Eng. trans.: Lond., 1754, vol. xi, p. 278.
they all concurred together to make up one particular distemper, but supposed them to come from some defects in spleen."

It would lead me too far to trace out all the points of resemblance, nor is it necessary for the purpose of this article that I should do so. I would, however, call attention to the fact that all modern observers are agreed that night-blindness is a frequent concomitant of scorbutus. Wolfgang Hoefer states that in the time of the Swiss war he had seen many soldiers and others suffering from night-blindness, due to the scarcity of provisions. These were all cured by an improved diet (curantur verò tales mutatione diææ in meliorem). Sir Gilbert Blane states that night-blindness, as a symptom of scurvy, had been reported to him by Mr. Telford, and Dr. W. Kerr alleges that it was a common occurrence among the scorbatic patients in the garrison of Gibraltar, during the siege of that place. Andrew Simpson also mentions the frequent co-existence of night-blindness and scurvy. The association has, however, in recent times been especially insisted on by Bampfield, and has been confirmed by others. In some cases of scurvy occurring in H.M. brigantine "Griffon," and recorded by Dr. Bryson, night-blindness was the first symptom of the disease.

The frequent association of scorbutus and night-blindness will not be disputed, and I have little hesitation in expressing the opinion that the many of the "nyctalopes" of Hippocrates were actually suffering from scurvy. If this opinion be well-founded, it lends powerful and independent support to the amended reading of ὄψ όρωντες, in "Prorhet.," ii, inasmuch as night-sight has never yet been observed as a concomitant of scorbutus, whereas night-blindness is often present.

2 "Hercules Medicus:" Noriberg, 1675; lib. i, c. viii, p. 72.
This hypothesis likewise furnishes a clue to the rationale of the alleged cure of nyctalopia by means of bullock's or goat's liver, as related above. The fresh roasted liver, whether of a bullock, goat, sheep, black-cock, or other animal would act beneficially on the scorbutic condition of the body, and would in this way expedite the cure of the disordered vision. It is worthy of note, too, that many of the other remedies recommended in the Hippocratic collection for the cure of nyctalopia are also serviceable in scurvy, and that the favourable prognostic signs are also those of scorbutus.

(5). For the fuller consideration of the fifth reason, namely, that there is good manuscript authority for the belief that the reading in the second book of the Prorrhetics should be that persons who do not see at night are called nyctalopes, I must, beyond what I have already incidentally remarked, refer the reader to Dr. Greenhill's letter and criticism, and especially to the valuable note on page 287. I may, however, observe that an omission of _ov_ or _ovk_ from ancient manuscripts is by no means rare. Such an omission occurs in the Hippocratic treatise _De Internis Affectionibus_, where persons who have ulcers on the legs with the skin black and thin, are said to be eager to walk about and to make exertion.1 This should obviously be read, "are not disposed to walk about or to make exertion," and is so read by Littré2 and Vander Linden,3 both of whom supply the _ov_. The omission of the word _ov_ is, in this instance, as in the second book of the Prorrhetics, obviously a fault of the copyist. The text in the latter instance, as Chamseru, Coray, Ermerins, and Dr. Greenhill believe, should be _oi δὲ τῆς νυκτὸς OT'X ὀρῶντες_ κ.τ.λ. Coray remarks4 that the inad-

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1 Foësius, "Hippoe.," sec. v, p. 119; Linden, ii, 256.
3 _Op. cit._, vol. ii, p. 256. It is an odd circumstance that while Vander Linden inserted _ov_ in the Greek text of his edition of Hippocrates, he did not correct the Latin translation, which is, "Est autem ad deambulandum ac laborandum promptus."
Vertent omission of οὖ is especially common after words ending in ὀς, as in this instance (νυκτὸς), or in the treatise "De Aëribus, Aquis, Lociis," where he has inserted οὖ between πλήθος and γιλυκαίνεια. ¹

The adoption of the reading οὖ όρωντες would not only get rid of the otherwise inexplicable confusion, but would furnish a meaning of the term nyctalopia more in accordance with the principles of etymology than night-sight supplies. Indeed, unless we are prepared to accept Voltaire's satirical definition of etymology, as "une science où les voyelles ne font rien, et les consonnes fort peu de chose," we must, independently of any other testimony, recognize the negative or privative element in the words "nyctalopia" and "hemeralopia." To employ the word nyctalopia as night-sight, and hemeralopia as night-blindness, seems, as I have already stated (p. 5), a philological extravagance and absurdity.²

The contention that truc night-blindness was not known in the time of Hippocrates, has been already met by anticipation in the comments on Aristotle's explanation of the differences of colour in the eyes, and of the causes of night-blindness in persons who have dark eyes. (See p. 17.)

On these grounds we must, I think, agree with Galen, that the true meaning of nyctalopia is night-blindness (ὁ τῆς νυκτὸς ἀλαός), and, consequently, that the true meaning of hemeralopia is day-blindness.

Unless, therefore, we are disposed to adopt the suggestion of the late Dr. Mackenzie, not to use these terms at all, in any sense, we should retrace our steps, and abandon the later (false) meanings for the original and true ones.


² See further, Dr. Greenhill's critical remarks, p. 288, et seq.