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History of ophthalmology

Uses of the word “macula” in written English, 1400–present



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ABSTRACT

We compiled uses of the word “macula” in written English by searching multiple databases, including the Early English Books Online Text Creation Partnership, America’s Historical Newspapers, the Gale Cengage Collections, and others. “Macula” has been used: as a non-medical “spot” or “stain”, literal or figurative, including in astronomy and in Shakespeare; as a medical skin lesion, occasionally with a following descriptive adjective, such as a color (macula alba); as a corneal lesion, including the earliest identified use in English, circa 1400; and to describe the center of the retina. Francesco Buzzi described a yellow color in the posterior pole (“retina tinta di un color giallo”) in 1782, but did not use the word “macula”. “Macula lutea” was published by Samuel Thomas von Sömmering by 1799, and subsequently used in 1818 by James Wardrop, which appears to be the first known use in English. The Google n-gram database shows a marked increase in the frequencies of both “macula” and “macula lutea” following the introduction of the ophthalmoscope in 1850. “Macula” has been used in multiple contexts in written English. Modern databases provide powerful tools to explore historical uses of this word, which may be underappreciated by contemporary ophthalmologists.

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1. Introduction

Ophthalmologists generally use the word “macula” to describe the central retina. In this context, “macula” is shortened from the term “macula lutea”, Latin for “yellow spot.” “Macula” is commonly used by ophthalmologists and the lay public, but the word has a rich history that may be underappreciated. Newer databases, encompassing millions of historical documents, provide powerful tools to explore various and changing uses of words through time. We have previously reported on the evolution and impact of various eye and vision terms,

although “macula” was not included in this study.¹¹ Here, we specifically investigate this word and its common uses from about 1400 through the present day.

2. Materials and methods

We searched the word “macula” in multiple databases, including the Early English Books Online Text Creation Partnership, which includes over 40,000 English-language texts during 1475–1700;^A America’s Historical Newspapers, which

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includes over 1,000 American newspapers from 1690 until the early 20th century;^B the Gale Cengage collections, including the 17th–18th Century Burney Collection Newspapers and the 19th Century British Newspapers; the Oxford English Dictionary; Google Scholar; and the Google n-gram database, which contains the annual frequencies of 1- to 5-word phrases (n-grams), based on approximately 6% of books ever published.¹²

3. Results

3.1. Frequencies of “macula” and “macula lutea”

The ophthalmoscope was first presented by Hermann von Helmholtz in 1850.¹³ The Google n-gram database shows that the term “macula lutea” seldom appeared in English language books prior to that time. The two-word term increased in frequency until about 1880, then became less commonly used in the 20th century, as it was shortened to simply “macula,” which peaked about 1900 (Fig. 1). Similarly, the term “macular degeneration” was not commonly used in English books until a century after the development of the ophthalmoscope, because the condition was initially labelled “choroiditis.” In fact, the frequency of the term “choroiditis” in English books in the latter portion of the 19th century was greater than the frequency of the term “macular degeneration” today.¹¹

The single word “macula” shows a subsequent increase in frequency peaking about 1970, which appears to reflect an increase in the clinical and histological study of the central retina. The word began to represent an ophthalmological subspecialty as well as an anatomic region, as illustrated by the founding of The Macula Society in 1977.

The apparent decline in the frequency of “macula” after about 1970 bears comment. In our previous study, many terms showed similar decreases in frequency during this time frame, including “amblyopia,” “glaucoma,” “ophthalmologist,” “visual acuity,” and others.¹¹ We believe this reflects an artifact of the database construction. Most books (especially the older ones) included in the Google corpus were obtained

from university libraries, but some (especially the newer ones) were contributed by publishers.¹² The changing character of the database over time may introduce a bias against books more typically found in university libraries, including medical and scientific texts.

3.2. “Macula” as a non-medical “spot”

“Macula” was commonly used to mean “spot” or “stain” or “error,” both literally and figuratively. For example, a 1493 religious text used the common Latin expression “sine macula,” meaning “spotless” or “immaculate”.^C Sir Thomas Eliot’s 1538 dictionary includes the entry “Macula, a spotte, a blemyshe.”^D William Shakespeare’s *Troilus and Cressida* includes the lines “For I will throw my gloue [glove] to death himselfe,/ That there is no maculaon [maculation] in thy heart.”^E

One 1773 poem in an American newspaper included: “There are *blockheads* & *sots*, aye, and *MACULAE SPOTS*,/As sure as the sun is *above us*;/*Mundungus*, and *RHOMBUS*, and *rascals* among us;/And *SOME* who *pretend* that they *love* us.”^F A 1789 newspaper contained this example: “In a word, however, to cut this matter short, *Tom* resolved to *turn over a new leaf*; for, in his book of life, he trusted there were many new ones, unsullied by the *macula* of vice ...”^G Multiple other examples were found during this time period, including in a political commentary: “He has been duly invested with the regular insignia, after undergoing a thorough catechism—the dark maculae of his federalism have been carefully whitewashed ...”^H This non-medical usage continued in U.S. newspapers as recently as 1919: “Oh Macula that painted to my pure heart ...”^I

The relationship between the words “mackerel” and “macula” is of interest. Some species of mackerel, such as the Atlantic Spanish mackerel (*Scomberomorus maculatus*), have prominent spots. A 1919 newspaper article published in at least five states included: “... the sole is so called from its resemblance to the flat of the foot ... and the mackerel the spotted fish (macula, a spot).”^{J–N} The *Oxford English Dictionary* (OED) disputes this explanation, however, citing a secondary English usage of “mackerel” meaning “procurer” or “pimp,” and

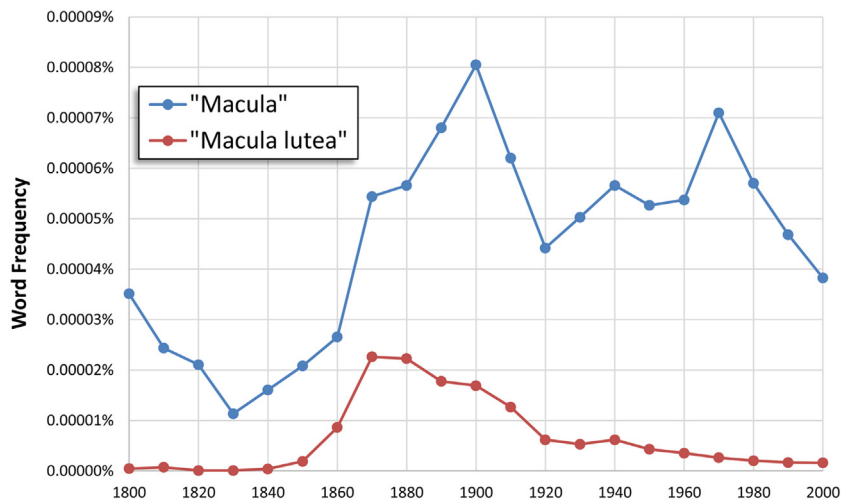


Fig. 1 – Word frequencies of “macula” and “macula lutea” using the Google English-language corpus. Google n-gram showing frequencies of the terms “macula” and “macula lutea” during the time frame 1800–2000. Note the increase in both terms after the 1850 introduction of the ophthalmoscope.

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