

# A Photo-Based Environmental History of the Use of Climbing Plants in Central Oxford, UK

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## ABSTRACT

This paper examines environmental change associated with climbing plants (ivy/creeper) on several historical buildings in central Oxford using archival photographs. ViewFinder from English Heritage was used to access the photo archives in an advanced search of the area of “Oxford” and in the county of “Oxfordshire”. The study includes a variety of buildings, including colleges, churches, chapels, asylums, inns/hotels, factories, a brewery, pubs, a castle as well as architectural elements, such as doorways, cloisters, gates, and walls. The findings reveal that a majority of photographs denoted ivy-/creeper-clad buildings (in nearly 53% of photographs found mostly in the Taunt collection). The greatest abundance of climbing plants was found in the 1880s followed by the 1900s. A further examination of University colleges is warranted due to the earlier and more frequent appearance of ivy/creeper on these buildings.

**Keywords:** Ivy; Creeper; Historical Buildings; Photo Archives; ViewFinder

## 1. Introduction

Historical photographs provide an abundant resource to understand environmental change as part of urban geographical studies. Urban greening has varied throughout the photo archival record and an analysis is presented here for Oxford, UK. More specifically, climbing plants (ivy/creeper) are tracked historically in a photo archival study that encompasses not only Oxford colleges, but also other non-University buildings located in the city center. The purpose of this research is to establish a clearer (broader or contextual) understanding of the use of ivy/creeper in an attempt to ascertain the reason for its appearance through temporal sequences of change captured by photographs taken at various locations. This contribution denotes geography from a combined human-physical perspective, which is evident in environmental geography. More specifically, it focuses on human-environment interactions and, hence, partakes of an environmental geomorphology, as demonstrated in previous similar (geographical) publications (e.g., [1]).

Because of the cross-disciplinary scope of addressing an environmental history of ivy/creeper, (to the author’s knowledge) there are no precedent published spatial-temporal studies for Oxford that examine ivy/creeper through the archival record, except for recent works in

progress by the author. The most relevant published work is a short “Sources” piece published in the journal of Environmental History on the use of postcards to track environmental change of ivy/creeper cover at Oxford colleges [2]. There is also an archival study conducted at Magdalen College, which examined the photo archival record in combination with historical records of traffic congestion at Magdalen Bridge [3]. In this study, the authors were more interested in investigating stone soiling and decay along the High Street frontage in connection with traffic pollution rather than the use of climbing plants, as in the current study. They did, however, include a photograph from the late 19th century (from circa 1896-1899, in their Figure 3) that clearly portrays ivy/creeper on Magdalen Tower. Previous to this, authors (e.g., [4]) also presented some case studies, as of the Bodleian Library from the Cattle Street front in 1904, 1939, 1952, and 1993 as well as the Tower of the Five Orders in circa 1880, circa 1900, 1956, and 1993; the Ashmolean Museum in 1882, 1960, 1963, 1976, and 1993; and Wadham College from the Parks Road front in circa 1820, 1885, 1956, early 1960s, and 1993. Here, the author saw the potential of archival evidence, especially photographs, as providing an objective framework for the study of the history of stone decay. Subsequently, archi-

val studies have been conducted using historical photographs from Trinity College (e.g., [5], who examined blistering based on archival photographs, including group photographs, such as of rowing eight from the summer of 1882) and also from Pembroke College, Oxford [6]. Other researches by these authors have focused on stone decay in general rather than on a biological cover, with work that utilized photographic surveying in order to capture cross-temporal and -spatial change (e.g., [7,8]). Much of this work was quantitative and aimed to measure (indoor and outdoor) soiling and decay of limestone (e.g., [9-13]). Most recently, a limestone weathering scale was developed [14] and applied [15] that also accounts for the impacts of a vegetation cover (including ivy/creeper) on limestone surfaces. Moreover, there have been further applications of quantitative photography to measure the greening of stone surfaces by algae [16] and provide an overview of Oxford studies written within a photogeomorphological approach [17]. Finally, the strengths and limitations of using climbing plants on historical stone (for heritage bioconservation) have been evaluated most recently [18].

The interest of climbing plants on old walls stems from current feelings of gardeners, which tend to be disparate—either for or against the use of ivy in particular. Indeed, looking around much of central Oxford, it is difficult to find evidence of climbing plants (in particular) on historical buildings today, except perhaps on boundary walls (such as at Trinity and Worcester Colleges) or unmaintained remains (such as at Rewley Abbey and the City Wall). However, it should be noted that there are exceptions and, for instance, ivy/creeper (especially creeper) can be seen growing on some buildings, even today at Trinity and Pembroke Colleges. There is a recent interest in the use of ivy (*Hedera helix*) and, in 2006, English Heritage funded a project that addressed ivy on walls (The “Ivy on walls—biodeterioration or bioprotection?” summarized in the poster: [http://www.srs.ac.uk/scienceandheritage/presentations/Ivy\\_poster.pdf](http://www.srs.ac.uk/scienceandheritage/presentations/Ivy_poster.pdf)). More details can be obtained from the project webpage: <http://www.geog.ox.ac.uk/research/arid-environments/rubble/ivy/>). This project considered the maintenance of ivy and the current practice of gardeners at colleges and other locations in England. The study does not, however, consist of an in-depth investigation into the historical record for an environmental history perspective of the appearance of ivy that may make an important contribution to an informed understanding of past use.

## 2. Methods

The overarching aim of the current study is to track the use of ivy/creeper on buildings in Oxford using historical photographs from the digital photo archive ViewFinder

maintained by English Heritage. Including non-college historical buildings allows for a consideration of use and practice in central Oxford (in the “town”) outside properties belonging to the University of Oxford (the “gown”). Such an approach lends to a further understanding of environmental history outside the University domain and may help to isolate trends in the record that may not be apparent by studying only colleges (e.g., [2,3,6]). There are three study objectives as follows: 1) to use View Finder to search for historical photographs; 2) to identify photographs in the study area that contain ivy/creeper; and 3) to examine any temporal patterns in the appearance of ivy/creeper. To this end, single, ground-level black-and-white photographs with a single year (known) date were examined on a present/absent basis.

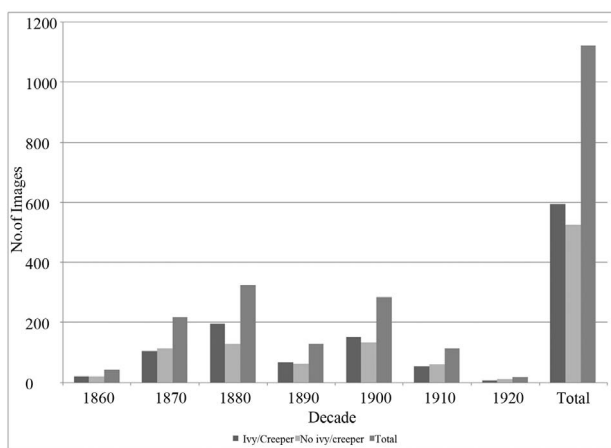
Historical photographs were searched in an image gallery in ViewFinder of the National Monuments Record in the public archive of English Heritage (webpage: <http://viewfinder.english-heritage.org.uk/home.asp?JS=True>). An advanced search of the image gallery was conducted for the county of “Oxfordshire”, in the area of “Oxford” (no other fields, including a particular collection, were specified). Only photographs depicting the outside (or exterior) of buildings were examined in this study, which consisted of colleges (including doorways, cloisters, gateways), churches, chapels, asylums, inns/hotels, factories, brewery, pubs, a castle, and walls, such as the City Wall and boundary walls. The following were excluded from the quantification: building interiors, gardens (e.g., the Botanic Garden), memorials, cemeteries, shops, streets/roads, locations outside central Oxford, rooftop and oblique views, artistic works (e.g., photographs of engravings), replicates (but not multiples), split images, and color images. Specific attention was paid to any climbing plants visible on the exterior of buildings, but photographs missing these were also considered in this investigation for a comparison of ivy-/creeper-clad versus ivy-/creeper-free buildings and building components. Buildings comprised both University and non-University properties with and without ivy/creeper located in the Oxford city center.

## 3. Results

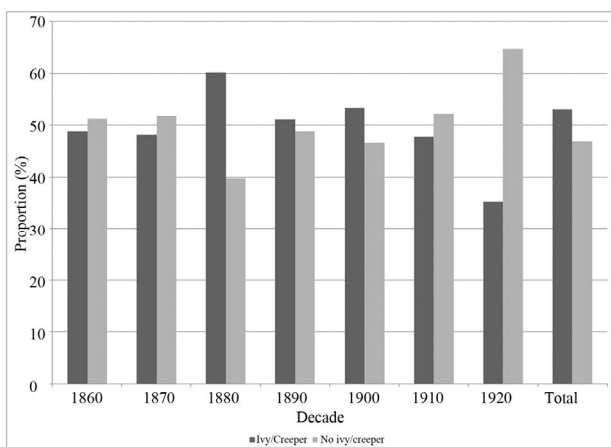
A majority of photographs were derived from the Henry W. Taunt (1860-1922) collection, comprising black and white images of Oxford. Others have photographed Oxford, including Eric de Mare (1945-1960), Nathaniel Lloyd (1920-1925), in the early 1900s: Newton, Rupert Potter, and John Maltby, and in the late 1800s: H. Bedford Lemere (1883). However, Taunt’s collection is extensive and comprises some 4435 images relevant to this investigation. In addition to Henry Taunt’s photographs, this study also consists of photography from the Alfred Newton and Son collection as well as the Rupert Potter

and the Nathaniel Lloyd collections. Out of a total of 4634 images that resulted from the advanced search, 1123 were relevant images (as specified in the Methods); of these, 596 had ivy/creeper cover and slightly fewer images (527) were without any ivy/creeper (**Figure 1**). When counts are taken as a proportion of the total at each location (**Figure 2**), there is an overall 53% of buildings with an ivy/creeper cover. The greatest proportion of ivy/creeper is evident in the 1880s (60%) followed by the 1900s (53%). As a measure of the grand total (of 1,123), ivy/creeper cover was greatest in the 1880s (17% compared to 11% without any ivy/creeper cover) with an almost equal representation (of with ivy/creeper versus no ivy/creeper) in other decades (**Figure 3**).

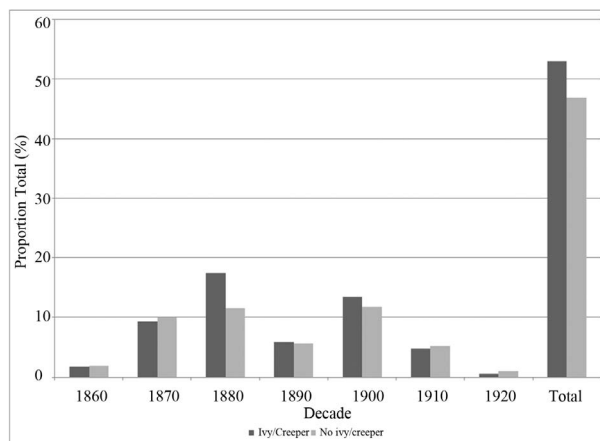
A wide variety of University and non-University buildings are represented in this study that are listed in **Table 1** (note that names of locations used throughout this paper are based on the spelling found in the View-



**Figure 1.** Counts of images from the View Finder archive based on the appearance of climbing plants (ivy/creeper) on building exteriors.



**Figure 2.** The decadal proportion of images conveying the appearance of climbing plants (ivy/creeper) on building exteriors.



**Figure 3.** The decadal proportion of images conveying the appearance of climbing plants (ivy/creeper) on building exteriors according to the total relevant images (of 1123) used from ViewFinder.

Finder database). A total of 64 buildings (about 59%) belonged to the “town” and 44 properties (about 41%) of the University of Oxford “gown” locations are represented. There are 20 instances of 100% ivy/creeper cover (or about 19% of the total 108 locations) and 47 instances of 100% no ivy/creeper cover (or about 44% of the 108 locations). Those locations with 100% ivy/creeper cover in all images contained in this photo archive include halls, manors, and great houses (e.g., Bishop King’s Palace, City Gaol, Frewin Hall, Grandpoint Hall, Judges Lodges, Medley Manor, Oxford Union, Radcliffe Infirmary, St Giles House, St Marys Hall, and Wycliffe Hall), some churches and chapels (e.g., Holywell Chapel, New Road Baptist Chapel, St Aldates Church, St Aloysius Church, St Michaels Church, St Peter Le Bailey Church, and St Thomas Church), and some University colleges (e.g., Brasenose College and Lady Margaret Hall).

Locations that are normally devoid of any climbing plants are non-University properties, including most churches, museums, hotels, pubs, and civic buildings. However, not all University buildings had an ivy/creeper cover, such as the Agricultural Sciences Department, Clarendon Building, Indian Institute, Manchester College, Radcliffe Camera, Radcliffe Sciences Library, St Peters College, St Stephens House, and Taylorian Institute. Nevertheless, University colleges most often appeared with climbing plants (e.g., All Souls, Balliol, Corpus Christi, Keble, Lincoln, Magdalen, Merton, New, Pembroke, Somerville, St Edmund Hall, St Hildas, Trinity, University, and Worcester Colleges). Of the 28 University colleges examined here, only two colleges (namely, Manchester and St Peters Colleges) did not have any ivy/creeper cover between 1860 and 1925. Out of 861 images of University colleges in this investigation, 495 (or about 57%) showed ivy/creeper and 366 (or about 43%)

**Table 1. Counts and proportions based on locations represented in this study.**

Location	Ivy/Creeper	No Ivy/Creeper	Total	% Ivy/Creeper	% No Ivy/Creeper
7 Princes Street	0	1	1	0	100
17 Broad Street	0	1	1	0	100
65 Holywell Street	2	1	3	67	33
Agricultural Sciences Department	0	1	1	0	100
All Saints Church	0	2	2	0	100
All Souls College	19	10	29	66	34
Apsley Paddox	0	6	6	0	100
Ashmolean Museum	0	4	4	0	100
Balliol College	37	20	57	65	35
Bear Inn	0	1	1	0	100
Bishop King's Palace	1	0	1	100	0
Black Hall	0	1	1	0	100
Blue Pig Public House	0	1	1	0	100
Bodleian Library	3	13	16	19	81
Brasenose College	10	34	44	23	77
Britannia Inn	1	0	1	100	0
Carfax Clock	0	1	1	0	100
Central Girls School	0	1	1	0	100
Christ Church Cathedral	11	3	14	79	21
Christ Church College	7	23	30	23	77
City Gaol	0	1	1	0	100
City Walls	4	0	4	100	0
Clarendon Building	0	2	2	0	100
Corpus Christi College	23	16	39	59	41
County Hall	0	1	1	0	100
Eastgate Hotel	0	5	5	0	100
Examination Schools	0	5	5	0	100
Exeter College	12	22	34	35	65
Frank Cooper's Works	0	2	2	0	100
Frewin Hall	3	0	3	100	0
Golden Cross Hotel	0	1	1	0	100
Grandpoint Hall	1	0	1	100	0
Hertford College	11	17	28	39	61
Holywell Chapel	1	0	1	100	0
Indian Institute	0	3	3	0	100
Jesus College	6	6	12	50	50

**Continued**

Jolly Farmers Inn	0	1	1	0	100
Judges Lodgings	1	0	1	100	0
Keble College	9	6	15	60	40
Kemp Hall Police Station	0	3	3	0	100
Lady Margaret Hall	2	0	2	100	0
Lincoln College	16	7	23	70	30
Magdalen College	98	46	144	68	32
Magdalen College School	0	1	1	0	100
Manchester College	0	2	2	0	100
Mansfield College	2	5	7	29	71
Medley Manor	2	0	2	100	0
Merton College	38	21	59	64	36
Morrells Brewery	0	1	1	0	100
New College	38	19	57	67	33
New Road Baptist Chapel	1	0	1	100	0
Old Ashmolean Museum	0	2	2	0	100
Old Gate House Public House	0	1	1	0	100
Old University Hall	4	2	6	67	33
Oriel College	8	11	19	42	58
Oxford Castle	6	5	11	55	45
Oxford Times Offices	0	1	1	0	100
Oxford Union	1	0	1	100	0
Pembroke College	12	7	19	63	37
Pusey House	0	2	2	0	100
Queen's College	5	13	18	28	72
Radcliffe Camera	0	3	3	0	100
Radcliffe Infirmary	3	0	3	100	0
Radcliffe Science Library	0	1	1	0	100
Randolph Hotel	1	1	2	50	50
Roebuck Hotel	0	5	5	0	100
Ruskin College	0	1	1	0	100
Sheldonian Theatre	1	3	4	25	75
Somerville College	2	1	3	67	33
St Aldates Church	2	0	2	100	0
St Aloysius Church	1	0	1	100	0
St Andrew's Church	0	1	1	0	100
St Barnabas' Church	0	1	1	0	100

**Continued**

St Bartholomew's Chapel	0	3	3	0	100
St Bartholomew's Hospital	0	1	1	0	100
St Cross Church	2	3	5	40	60
St Ebbes Church	1	1	2	50	50
St Edmund and St Frideswides Church	0	2	2	0	100
St Edmund Hall	9	2	11	82	18
St George's Chapel	0	1	1	0	100
St Giles' Church	1	8	9	11	89
St Giles House	2	0	2	100	0
St Hildas College	8	1	9	89	11
St Johns College	22	26	48	46	54
St Martins Church	0	8	8	0	100
St Mary Magdalens Church	1	14	15	7	93
St Mary the Virgin Church	9	4	13	69	31
St Marys Hall	1	0	1	100	0
St Matthews Church	0	2	2	0	100
St Michaels Church	7	0	7	100	0
St Paul's Church	0	1	1	0	100
St Peter in the East Church	6	3	9	67	33
St Peter Le Bailey Church	1	0	1	100	0
St Peters College	0	1	1	0	100
St Philip and St James Church	2	1	3	67	33
St Stephens House	0	1	1	0	100
St Thomas Church	3	0	3	100	0
Stones Almshouses	0	1	1	0	100
Taylorian Institute	0	3	3	0	100
Town Hall	0	6	6	0	100
Trinity College	21	17	38	55	45
Turf Tavern	0	2	2	0	100
University College	25	10	35	71	29
University Museum	2	3	5	40	60
Wadham College	6	21	27	22	78
Warneford Asylum	5	1	6	83	17
Worcester College	49	2	51	96	4
Wycliffe Hall	8	0	8	100	0
<b>Total</b>	<b>596</b>	<b>527</b>	<b>1123</b>	<b>53</b>	<b>47</b>

were devoid of climbing plants. This represents a total of almost 77% of the total record of 1123 examined in this study, including about 44% that showed climbing plants and 33% that excluded them.

**Table 2** presents a time-line (seriation) of the appearance of ivy/creeper on building exteriors (with University buildings emboldened). Buildings with a consistent ivy/creeper cover include: All Souls College, Balliol College,

**Table 2. Seriation of the appearance of ivy/creeper on building exteriors in central Oxford from the ViewFinder archive. Black cells represent the appearance of ivy/creeper and gray cells show where there is a lack of ivy/creeper. University properties are emboldened.**

Location	1860	1870	1880	1890	1900	1910	1920
7 Princes Street (1)						Gray	
17 Broad Street (1)				Gray			
65 Holywell Street (2)						Black	
65 Holywell Street (1)						Gray	
<b>Agricultural Sciences Department (1)</b>					Gray		
All Saints Church (2)					Gray		
<b>All Souls College (19)</b>	Black	Black	Black	Black	Black	Black	Black
<b>All Souls College (10)</b>	Gray	Gray	Gray	Gray	Gray	Gray	Gray
Apsley Paddock (6)						Gray	
Ashmolean Museum (4)			Gray				Gray
<b>Balliol College (37)</b>	Black	Black	Black	Black	Black	Black	Black
<b>Balliol College (20)</b>	Gray	Gray	Gray	Gray	Gray	Gray	Gray
Bear Inn (1)					Gray		
Bishop King's Palace (1)							Black
Black Hall (1)					Gray		
Blue Pig Public House (1)					Gray		
<b>Bodleian Library (3)</b>		Black					Black
<b>Bodleian Library (13)</b>	Gray	Gray	Gray	Gray	Gray	Gray	Gray
<b>Brasenose College (10)</b>				Black	Black	Black	Black
<b>Brasenose College (34)</b>	Gray	Gray	Gray	Gray	Gray	Gray	Gray
Britannia Inn (1)						Black	
Carfax Clock (1)					Gray		
Central Girls School (1)					Gray		
<b>Christ Church Cathedral (11)</b>	Black		Black	Black	Black	Black	Black
<b>Christ Church Cathedral (3)</b>		Gray				Gray	
<b>Christ Church College (7)</b>		Black	Black		Black		
<b>Christ Church College (23)</b>	Gray	Gray	Gray	Gray	Gray	Gray	Gray
City Gaol (1)						Gray	
City Walls (4)		Black			Black		
<b>Clarendon Building (2)</b>		Gray					
<b>Corpus Christi College (23)</b>	Black		Black	Black	Black	Black	Black

**Continued**

<b>Corpus Christi College (16)</b>	
County Hall (1)	
Eastgate Hotel (5)	
<b>Examination Schools (5)</b>	
<b>Exeter College (12)</b>	
<b>Exeter College (22)</b>	
Frank Cooper's Works (2)	
Frewin Hall (3)	
Golden Cross Hotel (1)	
Grandpoint Hall (1)	
<b>Hertford College (11)</b>	
<b>Hertford College (17)</b>	
Holywell Chapel (1)	
<b>Indian Institute (3)</b>	
<b>Jesus College (6)</b>	
<b>Jesus College (6)</b>	
Jolly Farmers Inn (1)	
Judges Lodgings (1)	
<b>Keble College (9)</b>	
<b>Keble College (6)</b>	
Kemp Hall Police Station (3)	
<b>Lady Margaret Hall (2)</b>	
<b>Lincoln College (16)</b>	
<b>Lincoln College (7)</b>	
<b>Magdalen College (98)</b>	
<b>Magdalen College (46)</b>	
Magdalen College School (1)	
<b>Manchester College (2)</b>	
<b>Mansfield College (2)</b>	
<b>Mansfield College (5)</b>	
Medley Manor (2)	
<b>Merton College (38)</b>	
<b>Merton College (21)</b>	
Morrells Brewery (1)	
<b>New College (38)</b>	
<b>New College (19)</b>	
New Road Baptist Chapel (1)	



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Old Ashmolean Museum (2)									
Old Gate House Public House (1)									
Old University Hall (4)									
Old University Hall (2)									
<b>Oriel College (8)</b>									
<b>Oriel College (11)</b>									
Oxford Castle (6)									
Oxford Castle (5)									
Oxford Times Offices (1)									
<b>Oxford Union (1)</b>									
<b>Pembroke College (12)</b>									
<b>Pembroke College (7)</b>									
Pusey House (2)									
<b>Queen's College (5)</b>									
<b>Queen's College (13)</b>									
<b>Radcliffe Camera (3)</b>									
Radcliffe Infirmary (3)									
<b>Radcliffe Science Library (1)</b>									
Randolph Hotel (1)									
Randolph Hotel (1)									
Roebuck Hotel (5)									
Ruskin College (1)									
<b>Sheldonian Theatre (1)</b>									
<b>Sheldonian Theatre (3)</b>									
<b>Somerville College (2)</b>									
<b>Somerville College (1)</b>									
St Aldates Church (2)									
St Aloysius Church (1)									
St Andrew's Church (1)									
St Barnabas' Church (1)									
St Bartholomew's Chapel (3)									
St Bartholomew's Hospital (1)									
St Cross Church (2)									
St Cross Church (3)									
St Ebbes Church (1)									
St Ebbes Church (1)									
St Edmund and St Frideswides Church (2)									
<b>St Edmund Hall (9)</b>									
<b>St Edmund Hall (2)</b>									

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St George's Chapel (1)							
St Giles' Church (1)							
St Giles' Church (8)							
St Giles House (2)							
<b>St Hildas College (8)</b>							
<b>St Hildas College (1)</b>							
<b>St Johns College (22)</b>							
<b>St Johns Church (26)</b>							
St Martins Church (8)							
St Mary Magdalens Church (1)							
St Mary Magdalens Church (14)							
St Mary the Virgin Church (9)							
St Mary the Virgin Church (4)							
St Marys Hall (1)							
St Matthews Church (2)							
St Michaels Church (7)							
St Paul's Church (1)							
<b>St Peter in the East Church (6)</b>							
<b>St Peter in the East Church (3)</b>							
St Peter Le Bailey Church (1)							
<b>St Peters College (1)</b>							
St Philip and St James Church (2)							
St Philip and St James Church (1)							
<b>St Stephens House (1)</b>							
St Thomas Church (3)							
Stones Almshouses (1)							
<b>Taylorian Institute (3)</b>							
Town Hall (6)							
<b>Trinity College (21)</b>							
<b>Trinity College (17)</b>							
Turf Tavern (2)							
<b>University College (25)</b>							
<b>University College (10)</b>							
<b>University Museum (2)</b>							
<b>University Museum (3)</b>							
<b>Wadham College (6)</b>							
<b>Wadham College (21)</b>							
Warneford Asylum (5)							
Warneford Asylum (1)							
<b>Worcester College (49)</b>							
<b>Worcester College (2)</b>							
<b>Wycliffe Hall (8)</b>							

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Magdalen College, St Edmund Hall, Trinity College, and University College, all of which are University colleges. Magdalen College had the most complete ivy/creeper cover of all properties examined in this study (it was also the most photographed in this record with 98 images). The earliest appearance of ivy/creeper (in the 1860s and 1870s) can be seen at All Souls College, Balliol College, Bodleian Library, Christ Church Cathedral, Christ Church College, Jesus College, Lincoln College, Magdalen College, Merton College, New College, Oriel College, Oxford Union, Pembroke College, Somerville College, St Edmund Hall, St Johns College, St Mary the Virgin Church, St Peter in the East Church, St Peter Le Bailey Church, Trinity College, University College, Wadham College, and Worcester College, which are mostly University properties.

A final analysis of the database results grouped all locations as either “town” or “gown”. Counts appear in **Table 3**, and a  $\chi^2$  test showed statistical significance to the 0.005 level. Most different from an equal probability were counts of no ivy/creeper in the “gown” sector, which was significantly less than expected. **Table 3** generally conveys most counts for no ivy/creeper in the “town” (36) as well as ivy/creeper in the “gown” (33).

There are some limitations to these findings. These limitations regard image (record) and database quality. The first main issue affecting the former (record quality) is that of picture size and quality, as associated with too far a distance. More specifically, picture size and quality (with a dimension of approximately  $700 \times 500$  pixels) posed limitations on the use of historical photographs in this study. In addition, another contributor to record quality is the lack of color (in the black and white photographs employed), which made it difficult to decipher (green) vegetation cover. Photographs without color made it more difficult to identify decay features and discriminate these from vegetation (especially in distant images). In order to resolve some of these issues associated with image (record) quality, images where building exteriors were blocked either by vegetation other than climbing plants or scaffolding were excluded; as were waterways, such as along the Cherwell, where it was difficult to make out climbing plants amongst other vegetation. Where buildings appear in the distance, and were too distant to make out details, they were also ex-

**Table 3. Results of  $\chi^2$  test = 13.5752 > 7.8795 (critical value),  $p < 0.005$ .**

	Ivy/Creeper	No Ivy/Creeper	Total
<b>Town</b>	28 (36)	36 (28)	64
<b>Gown</b>	33 (25)	11 (19)	44
<b>Total</b>	61	47	108

cluded, as at St Martin Carfax Church. Attempts were made to exclude any (climbing) vegetation that was not ivy/creeper (e.g., moss). In some cases, however, it was difficult to ascertain whether distant vegetation was indeed ivy/creeper rather than another type of climbing plant (as at Worcester College) or another type of vegetation altogether (such as decorative plants and flowers).

As for all other databases, the completeness of the record (database) needs to be questioned as well as whether all sides of building exteriors are represented photographically. However, comparisons including photographs where ivy/creeper is omitted help to portray a more complete record. Furthermore, since this study presents an overview of the ViewFinder database, it was not possible to develop specific case studies. It would be beneficial to compare print records of photographs from college photo archives (e.g., similar to work already completed for Magdalen College [3] as well as Trinity and Pembroke Colleges [6]; it is noteworthy that [2] was based on prints found in a published book and these images were derived from printed postcards that were derived from photographs taken at an earlier time and dated by stamp dates rather than actual photographic date as in the current study) in a comprehensive search for the appearance of ivy/creeper in the archival record. Solutions to these problems have been implemented in the execution of the research (in the Methods) and the error should be within 10% in view of these considerations and solutions.

#### 4. Conclusions

This study using ViewFinder has found an abundance of archival photographs showing ivy/creeper on the exterior facades of buildings in central Oxford. Buildings were more often covered by climbing plants (more than half of the time), and some locations were more often clad with ivy/creeper than others, especially at University colleges, such as All Souls, Balliol, Magdalen (in particular), St Edmund Hall, Trinity, and University Colleges. More climbing plants appear in photographs in this digital archival record taken in the 1880s and 1900s. This is founded in comparisons made within the available record out of a total proportion (including photographs not depicting ivy/creeper) to account for biases in the photographic record. There are, however, several limitations to this study that have been outlined, considered, and remedied in this paper. The research is accurate, as conveyed by similar temporal trends (for Oxford colleges) found in previously published works, e.g. [6].

An important finding was the high representation of University colleges in the ViewFinder database and the observation that University colleges were often adorned in climbing plants (ivy/creeper), which perhaps warrants further research of case studies based on Oxford college

photo archives. University buildings at large were more often covered with ivy/creeper than non-University properties, including churches and chapels, pubs, hotels, museums, the County and Town Halls, and so on. This was evident even though “gown” was less represented in this study than “town” locations. Statistical analysis using a  $\chi^2$  test revealed that more ivy/creeper appeared on “gown” properties of the University (e.g. fewer than expected Oxford colleges were bare of ivy/creeper) and that “town” buildings were more often unclad with ivy/creeper. This fundamental difference could be representative of a preference by the University of Oxford to allow for the growth of climbing plants on its buildings, possibly fostering a greener urban environment at an earlier date (in the 1860s and 1870s) than is evident in the City of Oxford. This preference could also be linked temporally to a Victorian tradition around 1837-1901 popularized in the 1880s and extended into the 1900s. Previous research based on postcard images, for instance, conveyed that between 1903 and 1923 Oxford colleges were clad in ivy/creeper. Other more recent studies (e.g., [6]) have conveyed a similar Victorian preference to climbing vegetation at Oxford colleges that was evident between 1880 and 1900 and reemerged more recently in the 1960s.

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