Project: Creating English Literature, ca. 1385-ca. 1425: inks, pigments and the textual canon

Time frame: October 2012 – September 2014

Lead Investigator: Alastair Minnis, Douglas Tracy Smith Professor of English

Summary: Professor Minnis will be engaged in interpreting data produced by the hyperspectral imaging of inks and pigments used in Middle English manuscripts; the methodology will be based on protocols developed by Professor Rushmeier (see below). An external Advisory Committee will ensure that the manuscripts selected for imaging are the most significant for this study and will also ensure an intellectually rigorous approach to interpretation throughout the study. Communication among members of the Committee will be both in face-to-face meetings and through digital interaction.

The importance, and potential consequences, of this proposed study are hard to exaggerate. According to Professor Minnis: "What is at stake are the origins of the first major canon of English Literature, in Middle English. Specifically, *how* key texts by leading authors of the day – namely, Chaucer, Gower, Langland and Hoccleve - were produced, *who* produced them, and *where* they were produced." There is considerable scholarly debate concerning the identification of several vital scribes, and which manuscripts they were involved in producing. Recently the London Guildhall has recently been claimed as "the cradle of English Literature", scribes associated with it being deemed responsible for the production of foundational texts of English Literary History.

Thus far the various arguments have depended on two long-established approaches: (1) the visual approach to manuscript studies used by paleographers and art historians who are attempting to identify "hands" and to date and place a given manuscript, and (2) dialect studies, which seek to identify "provenances," the linguistic regions within which the manuscripts were written. It is hoped that pigmentation analysis will bring another methodology into play: non-invasive scientific analysis (primarily spectrographic) of the inks and pigments used by scribes and decorators in England (especially London) within the crucial time period, ca. 1385- ca. 1425. The objective of the testing of inks and pigments is to supplement scholarship already undertaken, as well as to inspire future research, in the fields of palaeography, art history and linguistics, and to provide scientifically generated data to contribute to the on-going discourse about the production of late medieval manuscripts in England. Already this proposed project has attracted considerable international interest, with various scholars volunteering to contribute their time to the Advisory Committee to the project.

Members of the Advisory Committee include: Caroline Barron, Professor Emerita, Royal Holloway, University of London; Ardis Butterfield, Professor of English, Yale University; Vincent Gillespie, J.R.R. Tolkien Professor of English Literature and Language, Lady Margaret

Hall, University of Oxford; Ralph Hanna, Professor Emeritus of Palaeography and Tutorial Fellow in English at Keble College, University of Oxford; Simon Horobin, Professor of English Language and Literature, Magdalen College, University of Oxford; Linne Mooney, Professor of Medieval English Palaeography, University of York; Jane Roberts, Professor Emerita at King's College, London, and Senior Research Fellow at the Institute of English Studies, University of London; Kathleen L. Scott, Independent Scholar; Estelle Stubbs, Honorary Research Fellow of the School of English Literature, Language and Linguistics, University of Sheffield; Daniel Wakelin, Jeremy Griffiths Professor of Medieval English Palaeography, St. Hilda's College, University of Oxford.

Goals and methodology: A list of manuscripts which will form the digital corpora for this project was formulated at the first workshop of the Advisory Committee in October 2012, at Jesus College, Oxford. This includes: six manuscripts of Chaucer's *Canterbury Tales*, thirteen contemporary and possibly related metropolitan manuscripts, and some fifteen 'provincial' manuscripts which will form a vital 'contrast group' with the metropolitan manuscripts. Digital images of the manuscripts will be requested and ingested into the Yale repository. For each manuscript, or for each scribal hand within a given manuscript, multiple hyperspectral images of selected full pages will be captured *in situ* with a compact and mobile hyperspectral imaging system. Data will be recorded in five broad bands in the range of near-ultraviolet to near-infrared radiation, to identify pigments. The Committee will advise on the selection of the specific manuscript pages for this purpose.

The images thus produced will be analyzed by a team consisting of Professor Rushmeier, the postdoctoral research associate, and conservators to measure and document reflectances using a characterization method established in a preliminary test (http://graphics.cs.yale.edu/minhkim/publications/vast2011/vast2011.html). Radiometric measurements will be gathered in a dataset and datasets of inks and pigments created so that the imaging results can be compared and contrasted across the corpus of manuscripts. The datasets thus created will be linked to the digital images of the manuscripts; the scholars on the Advisory Committee would have the option of annotating the images and circulating their questions about and/or interpretation of the data.

The second meeting of the Advisory Committee would be held in New Haven at Yale's Beinecke Rare Book and Manuscript Library in late April or May of 2014. The purpose of the meeting is to review the computational results of the hyperspectral imaging and to formulate some initial conclusions about the significance of the testing in the context of the current scholarly debate about manuscript production of canonical texts in late medieval England.

Deliverables: Professor Minnis, who is the incoming president of the New Chaucer Society, will present a progress report in the Society's Newsletter and at this society's conference in the summer of 2014, as well as at the John Gower Society's conference which will be held around the same time. Professor Rushmeier and the postdoctoral research associate will likewise disseminate methodology and results in technical computer science venues.

A database of the measured spectrum of pigments for use in future analysis and augmentations will be made available through a web page that will continue to have scholarly applications as well as provide valuable data for conservation.

Documented protocols for the characterization of the hyperspectral imaging system and methods will be established and disseminated.

Project Personnel:

Alastair Minnis, Douglas Tracy Smith Professor of English

Eric Weiskott, Assistant for Digital Humanities