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Computer Use in History and the Humanities

by Thomas Wm. Madron
Manager of Academic Computing and Technical Support Services
and Professor of Political Science
North Texas State University
Denton, TX 76203

Although there have been a considerable number of articles and other publications written concerning computers and the humanities, it is nevertheless true that in areas such as history, languages, theology, and similar disciplines computer use is marginal. The source of the problem lies with the fact that people trained in history and the humanities rarely receive any technical training, and may, in fact, be afraid of technology itself. These remarks are designed to demonstrate that computers have value to the humanistic disciplines. The failure to use the technology leads to research which is poorer than it should be. At the outset it should be stressed that this is not a paper which necessarily advocates the quantification of the humanities (although that may sometimes occur). Rather, we will seek to demonstrate a wide variety of ways in which the humanities may use computing including applications to traditional modes of research.

Computers range from desktop size (microcomputers) to very large "mainframe" systems. As with more quantitative disciplines, almost all sizes of computers have application to research in the humanities. If one's vocation is research in largely qualitative terms, then computers can assist in the analysis, evaluation and production of text and other documents. To refuse to use computers in this context would be somewhat analogous to scholars of the fifteenth century refusing to have books printed, preferring instead the use of parchment scrolls produced by hand. That, of course, did

not happen and within a very few years after Gutenberg's invention of movable type, the use of handwritten scrolls was discontinued. The analogy between current uses of computers and the invention of movable type is not accidental, for computers constitute a major resource in information dissemination as did the printed word of another era.

A less traditional (for the humanistic disciplines at least) use of computers is in the use of quantitative analysis. Only in very recent times have we started to hear terms such as "quantitative history," although any political scientist or economist doing time series analysis has engaged in the quantification of historical analysis. The humanistic disciplines have been especially weak in using quantitative methods. While these methods do not require computers, many people identify computer use with quantification. Although classical scholars such as Plato and Aristotle regarded mathematics as one of the primary disciplines, those who study such people are often without mathematical or quantitative skills. In some respects, these perspectives even extend to the analysis of historical figures such as John Wesley. Wesley's first book, after all, was a textbook on logic and logic is a discipline eminently suitable for computer analysis and mathematics is but a special case of logic.

This paper is divided into three parts: 1) a review of possible uses of computers in the humanities; 2) an illustration of the specific manner in which we might apply computers in the humanities; and 3) comments on the informational and database needs for adequate use. As a byproduct of a long-term and continuing interest in the analysis of the writings of John Wesley, beginning with my dissertation entitled, The Political Thought of John Wesley (New Orleans, LA: Tulane University, 1965), illustrations

throughout will be in the context of Wesleyan studies, a topic of somewhat narrow interest, but useful in this context.

Using Computers

Perhaps the most fruitful use of computers in the humanities would be in the support of traditional research. For anyone involved in the crafting of words and sentences--in the art of writing--computers can be a real boon. In large organizations (business, industry, government, and education) the term "office automation" has become popular and useful. While substantial amounts of money have been invested in industrial and farm workers in industrialized nations to provide the technology to improve productivity, white collar office workers (including those engaged in scholarship) have continued to do their tasks in much the same way such work has always been accomplished--by hand. Large organizations are now recognizing, however, that office productivity must be improved. This is especially important when we remember that in nations such as the United States, it will not be long before most working people will be engaged either directly or indirectly in information producing occupations. By the early eighties it was possible to acquire computer assistance (microcomputers) using "off the shelf" software (the programs or instructions which make computers work) at prices not greatly different from modern electric typewriters--well within the financial capabilities of many individuals.

Perhaps the most obvious application which might assist people engaged in humanistic and historical research is word processing. Word processing refers to the use of computers as sophisticated replacements for pencils and typewriters. Word processing systems exist on small, medium, and large computer systems. This paper was written on a microcomputer

although it could just as well have been written on a large central system. A word processing system is made up of at least two components: a text editor and a text formatter. The text editor allows the entry and manipulation of text, while the text formatter prints the text in a properly formatted manner. The use of a word processing system can increase the speed with which text can be produced, and at a minimum, it can improve the quality of the editing to which a document is subjected. When a computer is used for writing rather than pencils, pens, or typewriters, an author can afford the fine tuning of the document in a way which would otherwise be avoided. Small as well as large changes become easy to make. In addition, by using a word processing system it is possible to make use of programs such as word counters as an aid to producing documents of appropriate sizes (an ability which is especially useful when writing for publication). A word counting program, especially on a microcomputer, is trivial to write but can be a useful adjunct to a word processing system.

Closely related to the production of larger texts, either in the original writing stages or in editorial work, is notetaking and list management. Microcomputer^s which which provide assistance for both these tasks are readily available. Traditional scholarship frequently entails detailed notetaking on index cards of information (data) gleaned from various texts. Scholars develop personalized styles to approach this problem. A notetaking program on a micro could assist an individual in taking and classifying notes. Indeed, if a corpus of material were available in machine readable form (Wesley's works, for example), a program could be written to read through a text in which the researcher had imbedded characters to mark the beginning and ending of blocks of text to be transferred to note cards (on the computer's printer) so that the researcher would not even have to retype any

text. Part of the research process at times can also involve keeping lists of items related to the topic of interest. There are, today, many data management programs uniquely adapted to assist with the management of such lists, including the ability to make the lists in the first place, edit and correct them, then sort them and retrieve them in a variety of ways.

Part of the problem of doing traditional research is simply finding appropriate passages in a timely fashion. While compilations of the works of historical figures, such as Wesley, normally have decent indices, any user of such publications is aware that the indices are frequently lacking on one fashion or another. Yet, if the text is already in machine readable form, computers can easily provide assistance in the generation of indices and concordances. An illustration of what can be done with textual material on large-scale computers is a dissertation by Beverly B. Madron entitled, Design of a Computer-Based System for Research in and Teaching of Literature (Nashville, TN: George Peabody College, 1979). The system written by B. Madron, called TUIT for short (Technology Utilized for Investigation and Teaching), is a generalized system for doing a variety of activities with text including the generation of indices, readability measures, and counts of words, syllables, and the like.

According to B. Madron the name of the system, while constituting an appropriate acronym, ^{was} ~~can~~ from a totally unrelated source (B. Madron, p. 4). A local politician was fed up with people who didn't do things because they "never got around to it." As a part of his reelection campaign he distributed wooden disks called TUITs, so everyone had a "round TUIT" and could get on with the job at hand. An analogous situation exists in many of the humanistic disciplines regarding computing--many people need to learn the use of the technology but have never gotten around to it. Examples of the output from

TUIT are provided later in this paper. While the cost of putting text into machine readable form is not entirely trivial, neither is it beyond the bounds of reason.

During the early sixties, when computing was, relatively, still in its infancy, considerable work was done pointing toward automated techniques of content analysis. Content analysis is a quantitative extension of traditional analytical research in that the effort is made to code text and assign numerical values to portions of the text for later statistical analysis. An example of such early efforts was The General Inquirer. Largely due to a lack of funding those early efforts at automating content analysis stopped sometime in the late sixties or early seventies. In the meantime, however, with major improvements in computer technology, the time is ripe for a renewed effort in this area. By combining the output of systems such as TUIT with content analysis methodology, it would be possible to construct a dataset, perhaps organized by time, which could explicitly trace the development of an idea in a way far more comprehensive than is possible with traditional historiographical techniques. If such an effort was made with the works of an individual like Wesley, for example, it would be possible to explicitly trace the development of his interests and thinking not only with respect to his theology and general philosophy, but also to his psychology.

A somewhat related use of computers in the analysis of documents is their use in authenticity studies. One of the classic examples was the assignment of authorship of each of The Federalist Papers by Mosteller and Wallace (Inference and Disputed Authorship: the Federalist [Reading, MASS: Addison-Wesley, 1964⁷]). More recently, similar techniques have been applied to the Bible by biblical scholars. If authenticity is not a problem, then the editing of editions of the works of historical figures such as Wesley can be.

The last edition of Wesley's "complete" works was published in 1872, although it has subsequently been reissued. And, of course, a new edition (published by Oxford University Press) of Wesley's works is underway, although it is not slated to be finished until after the turn of the 21st century. If Wesley's works were to be converted to machine readable form, and a standardized approach made to editing the documents in the new edition, the editorial chores could be made both faster and quite possibly more complete.

A discussion of the uses of computers in historical research would not be complete without mentioning the potential of quantitative historical research. A considerable amount of quantitative data from various historical periods exists. Certainly historians of various periods and places can find voting records (both popular votes and votes of legislative bodies), census data, and other quantitative information which would allow the direct description and testing of conditions and hypotheses concerning human behavior. A significant amount of such data can be acquired through data archives such as the Inter-University Consortium for Political and ^{social behavior} at the University of Michigan. Scholars at the University of Minnesota have had an ongoing project for some years devoted to computerizing records contained on clay tablets from the ancient nations of the Tigris and Euphrates valley. The use of such data requires not only learning something about computers, but also the appropriate use of statistics.

Finally, in many disciplines today computers are routinely used to assist in the bibliographic work which is a necessary prelude to any serious research. Services such as DIALOG, owned by Lockheed (California), are accessible through virtually all research libraries in the United States. While DIALOG is geared for the physical sciences, social sciences, and business,

similar systems would be possible and appropriate for more specialized study areas. The advantage of doing bibliographic searches by computer is that if the bibliographic database has been established, such a search is inevitably more complete than one done by hand literally sitting in a library. Related computer applications include information retrieval of newspaper based information from such "information utilities" as the Source or Compuserv. Through these sources one can look at current newspapers, the UPI wire service, or segments of the New York Times archive.

In the next section we will present some illustrations of the way in which subdisciplines such as Wesley studies can be assisted by the use of computers.

Illustrated Use of Computing in Wesley Studies

In order to provide some flavor of how we might go about using computing facilities to assist in Wesleyan studies it should be noted that there are various steps we must climb. At each step there can be some decisions which will encourage or discourage success at the next step. A good bit of the planning necessary for a project is the ordinary planning inherent in any decent research design. Those which are of greatest concern at this point are described in the following sections.

Translation of Text to Machine Readable Form

In data processing parlance this is normally referred to as "data entry." Some planning is required preparatory to entering the data so that it can actually be read by the programs we intend to use. For this illustration I intended to do some runs on TUIT as well as some other text manipulation

with a text editor and formatter. There were actually several different approaches which could be chosen: enter the data in some "quick-and-dirty" ~~and~~ manner then let TUIT straighten it out. TUIT has a file modification program and could have been used for this purpose. Because of the format for the data required by TUIT, however, that approach would have made it difficult to handle for other purposes. A second approach was to provide relatively precise instructions as to how the data were to be entered--this is the approach which was used.

Four illustrative Wesleyan texts were chosen (although only one is used in this paper):

Thoughts Concerning the Origin of Power

Thoughts upon Liberty

Thoughts upon Slavery

Thoughts on the Present Scarcity of Provisions

Each of these documents may be found in Volume XI of the Zondervan reprint of the 1872 edition of Wesley's Works. The data entry staff entered the four texts directly into a "user id" on a timesharing system. They were instructed to keep the line length relatively short (72 characters or less) as a byproduct of my intent to ultimately use the text on a microcomputer. They were further instructed to place in the text a marker indicating when the printed text changed from one page to another. The marker looked like this:

.pa nn

where "nn" was the next page number. The reason for this is that ultimately, in order to do indexing, the data had to contain a page and volume reference. The ".pa nn" marker was simply an easy way for the data entry people to

handle page breaks and I produced a very short little program which would properly format the text using the information contained in the marker.

Text Manipulation and Modification

When the data were entered and checked I proceeded to "download" the text from our large central computer to a microcomputer so that I could further manipulate the text at my leisure, both at home and at my office. At that point the texts were edited a bit further and sent through a text formatter which produced a somewhat modified machine readable file. A short program was then written which would read the data and produce yet another machine readable file in the format required by TUIT.

TUIT requires a file composed of records of 80 characters in length with significant text in columns 1-72. Columns 73-80 are reserved for reference information such as volume and page numbers. TUIT's own data modification procedure can be used to place the text in this format, the text can be initially entered in that format, or a procedure such as I am describing can be used. The primary reason why I chose the route I did was to provide myself with intermediate versions of the text which I could further manipulate on my microcomputer outside of TUIT. Once I had produced the TUIT file I then "uploaded" the resulting datasets back to our timesharing system and ran TUIT against them.

Textual Analysis

However the text is prepared, once it is ready it is simplicity itself to produce various reports with TUIT. A Keyword in Context (KWIC) index, for example, indexing all words (although this is optional) can be set up as follows:

```
//jobname JOB [installation standard job card]
// EXEC TUIT[,other parameters as needed]
RUN INDEX [a TUIT command as are the following]
.NAME Wesley - Origin of Power [optional]
.KWIC
```

That is all there is to it to obtain a comprehensive index such as that illustrated in the following partial KWIC index:

Figure 1
Sample KWIC Index
Wesley - Thoughts Concerning the Origin of Power

A	FREE AS MEN? AND, IF THEY ARE, WHY HAVE THEY NOT AS GOOD	V11	49
A	SEEING IT IS UNDENIABLE, THEY THAT GAVE THE POWER HAVE	V11	49
A	HAS HE NOT A SOUL AND A BODY? HAS HE NOT THE NATURE OF	V11	50
A	SO CLEAR AND CERTAIN A PROSPECT OF WHAT IS AT TOO GREAT	V11	51
A	NOT." IT PLAINLY FOLLOWS, THAT NO MAN CAN GIVE TO ANOTHER	V11	52
A	PEOPLE; IF HE MEAN THEREBY, THOUGH NOT ALL THE PEOPLE, YET	V11	52
A	BALL OF CONTENTION TO THE NEXT UNDECIDED STILL, TO BE	V11	47
A	BEARD; AFTER DEPRIVING MYRIADS NATURAL RIGHT FOR WANT OF	V11	49
A	BODY? HAS HE NOT THE NATURE OF A HAS HE NOT A SOUL AND	V11	50
A	DEMOCRACY. THIS SEEMS TO HAVE BEEN THE ANCIENT FORM TERMED	V11	47
A	A FEW HUNDRED LORDS AND GENTLEMEN, WHO, OBSERVING THEY WERE	V11	52
A	A FEW OF THE NOBLES. IT IS REALLY LODGED IN	V11	47
A	GROAT? IS HE NOT A MAN, WHETHER HE BE RICH OR POOR? OR NOT	V11	50
A	A LAW MADE WITHOUT HIS CONSENT IS, WITH REGARD CONSEQUENCE,	V11	50
A	A LITTLE EXPLAINING; FOR EVERY ONE DOES NOT UNDERSTAND THE	V11	48
A	A LITTLE UPON IT, WILL ONE SINGLE CONSIDERATION, IF HE DWELL	V11	52
A	A MAN FROM BEING ONE OF THIS? BY WHAT RIGHT DO YOU EXCLUDE	V11	50
A	A MAN, ALL THAT FLOW MAN; CONSEQUENTLY, ALL THE RIGHTS OF	V11	50
A	A MAN, WHETHER HE BE RICH OR POOR? OR NOT A GROAT? IS HE NOT	V11	50
A	A NECESSITY OF QUESTION, "WHO ARE THE PEOPLE?" REDUCED TO	V11	50
A	A PROPER RIGHT TO THE SUPREME THOUSAND YEARS, WHO HAS HAD	V11	52

A PROSPECT OF WHAT IS AT TOO GREAT A	SO CLEAR AND CERTAIN	V11	51
A QUARTER, NOT BY A TENTH PART, OF THEM. SO THAT THE	NOT BY	V11	51
A RIGHT INHERENT, INSEPARABLE FROM HUMAN	INDEFEASIBLE RIGHT;	V11	49
A RIGHT OF CHOOSING HIS GOVERNORS	STAND; NAMELY, THAT	V11	52
A RIGHT TO CHOOSE THEIR OWN GOVERNORS; AN	THEY HAVE	V11	49
A RIGHT TO DISPOSE	NO, NOR WITH HIS CONSENT; FOR NO MAN HAS	V11	52
A RIGHT TO TAKE AWAY THE POWER THEY GAVE? AND DOES	THEY NOT	V11	48
A RIGHT TO TAKE AWAY LIFE.	SHARD, ANY SUCH POWER AS IMPLIES	V11	52
A RIGHT WHICH ONLY THE	RIGHT WHICH HE NEVER HAD HIMSELF;	V11	52
A ROYAL SHARD;	ONE, NAMELY THE DOGE; BUT IN FACT, HE IS ONLY	V11	47
A SHORT ISSUE. IT IS ALLOWED, NO MAN	BRING THE QUESTION TO	V11	52
A SINGLE PERSON. THIS HAS BEEN THE CASE IN ALMOST	LODGED IN	V11	46
A SOUL AND A BODY? HAS HE NOT THE NATURE OF A	HAS HE NOT	V11	50
A STIFF BEARD, FOR NOT HAVING LIVED ONE-	MORE FOR WANT OF	V11	49
A SUBJECT OF DEBATE. AND IT HAS BEEN DEBATED WITH THE	LONG	V11	47
A TENTH PART OF THEM.	THEY MEAN SCARCE	V11	50
A TENTH PART, OF THEM. SO THAT THE	NOT BY A QUARTER, NOT BY	V11	51
A THIRD, SUPPOSE TWO MILLIONS LEFT, YOU EXCLUDE THREE-		V11	50
A TRUTH LITTLE LESS	FULLEST AND STRONGEST PERSUASION, AS	V11	48
A VARIETY OF DISPUTANTS. BUT AS EARNEST AS	UTMOST WARMTH, BY	V11	47
A VIEW	DISTANCE, WHETHER OF TIME OR PLACE, LET US ONLY TAKE	V11	51
A VOICE IN	THEN SHOULD NOT EVERY MAN, WOMAN, AND CHILD, HAVE	V11	48
A VOICE IN DISPLACING THEM TOO;	SHOULD NOT EVERY ONE HAVE	V11	49
A YEAR." WORSE	FREEHOLDERS, UNLESS THEY HAVE FORTY SHILLINGS	V11	49
A YEAR; YEA,	THE PEOPLE BECAUSE HE HAS NOT FORTY SHILLINGS	V11	50
A YOUNG FISHERMAN. BUT	ANDIELLO, (VULGARLY CALLED MASANELLO,)	V11	52
ABLE TO DO, SINCE THOUGH THEY HAVE MOST	IT IS CERTAIN WE ARE	V11	49
ABOVE ANOTHER; AND ALL	EARTH ARE NATURALLY EQUAL; NONE IS	V11	48
ABOVE SEVEN HUNDRED YEARS OF THE PEOPLE OF ENGLAND'S	IN	V11	52
ABSOLUTE MONARCHY ESTABLISHED THERE ALSO; THE WHOLE	FOUND	V11	46
ABSOLUTELY	ORIGIN OF POWER, IS EVERY WAY INDEFENSIBLE. IT IS	V11	52
ABSDURD TO OPPOSE WHAT IS CONFIRMED BY THE GENERAL SUFFRAGE		V11	48
ABYSSINIA. THE FIRST ADVENTURERS TO AMERICA	OF MOROCCO AND	V11	46
ACCOUNT NEITHER; IF SO, IT MIGHT BE MORE TOLERABLE. BUT HERE		V11	50
ACCOUNT, SUPPOSE WE SHOULD NOT EXACTLY AGREE. LET EVERY ONE		V11	47
ACRES OF LAND! HOW IS	PEOPLE BECAUSE HE HAS NOT TWO OR THREE	V11	50
ACT OR DEED OF THE PEOPLE. THEIR	DID NOT RECEIVE IT BY ANY	V11	52
ACTION. IT	ARE NATURALLY FREE, MASTERS OF THEIR OWN	V11	48
ACTIONS; THAT NONE CAN	NATURALLY FREE; MASTERS OF THEIR OWN	V11	48
ADD,	CAN DISPOSE OF ANOTHER'S LIFE BUT BY HIS OWN CONSENT. I	V11	52
ADULT MEN AND	TO MEN ONLY, BUT TO WOMEN ALSO; NOR ONLY TO	V11	53
ADVENTURERS TO AMERICA	OF MOROCCO AND ABYSSINIA. THE FIRST	V11	46
AFFAIR.	OF THE WHOLE	V11	51
AFFAIRS, MET TOGETHER ON THAT	THE DESPERATE STATE OF PUBLIC	V11	52
AFFECTED TO DENY IT, HE WOULD IN MOST	HENCE IF ANY MAN	V11	48
AFFIRM IT? DID THE PEOPLE OF ENGLAND, OR BUT	HARDY AS TO	V11	51
AFFIRMED, IS IT NOT OUR FUNDAMENTAL PRINCIPLE, OUR		V11	48
AFRIC,	GOVERNMENT OBTAINED VERY EARLY IN VERY MANY PARTS OF	V11	46
AFTER	STYLED ARISTOCRACY, OBTAINED IN GREECE AND IN ROME,	V11	46
AFTER DEPRIVING HALF THE HUMAN SPECIES OF THEIR	AND WORSE.	V11	49
AFTER DEPRIVING MYRIADS	NATURAL RIGHT FOR WANT OF A BEARD;	V11	49
AFTER THE EXPULSION OF THE KINGS.	HAS AT ROME FOR SOME AGES	V11	47
AGAINST THE ILLEGAL ENCROACHMENTS OF	DEFENDING THEIR RIGHTS	V11	47
AGE, THE PEOPLE? ARE ALL MALES, THEN, THAT HAVE	MEN OF FULL	V11	49
AGES AFTER THE EXPULSION OF THE KINGS.	HAS AT ROME FOR SOME	V11	47

AGES OF THE	MANY STRUGGLES WITH THE PEOPLE, DURING THE LATER	V11	47
AGREE. LET EVERY ONE	ACCOUNT, SUPPOSE HE SHOULD NOT EXACTLY	V11	47
ALL	EARTH ARE NATURALLY EQUAL; NONE IS ABOVE ANOTHER; AND	V11	48
ALL	VOTES THEY HAVE LEAST STRENGTH,) ARE ALL THAT REMAIN,	V11	49
ALL HUMAN CREATURES ARE	UPON EARTH ARE NATURALLY EQUAL; THAT	V11	48
ALL MALES, THEN, THAT HAVE	MEN OF FULL AGE, THE PEOPLE? ARE	V11	49
ALL MEN; NOT	CONSEQUENTLY, NOT TO FREEHOLDERS ALONE, BUT TO	V11	53
ALL POSSIBILITY	THAN SELF-EVIDENT, AS WHAT IS CLEAR BEYOND	V11	48
ALL POWER IS DERIVED FROM THE PEOPLE; AND PRESENTLY EXCLUDED		V11	50
ALL POWER.	UNITED PROVINCES THE STATES ARE THE FOUNTAIN OF	V11	47
ALL REASONABLE MEN.	OF DOUBT, WHAT COMMANDS THE ASSENT OF	V11	48
ALL THAT FLOW	MAN; CONSEQUENTLY, ALL THE RIGHTS OF A MAN,	V11	50
ALL THAT REMAIN, ALL	VOTES THEY HAVE LEAST STRENGTH,) ARE	V11	49
ALL THE PEOPLE, YET A	PEOPLE; IF WE MEAN THEREBY, THOUGH NOT	V11	52
ALL THE RIGHTS OF A MAN, ALL THAT FLOW	MAN; CONSEQUENTLY,	V11	50
ALL THINGS OF AN INFERIOR NATURE.	PROPERTY, AND	V11	46
ALL WHO HAVE NOT THIS WISDOM, YOU WILL LEAVE	IF YOU EXCLUDE	V11	49
ALL.	DEATH, BUT WHAT IS DERIVED FROM GOD, THE SOVERIGN OF	V11	48
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.			
.			
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WHOM THEY PLEASE, EITHER ONE OR MORE PERSONS; AND THAT, IN		V11	48
WHY	ENTRUSTED? AND	V11	48
WHY	HAVE ANY POWER OVER OTHERS, BUT BY THEIR OWN CONSENT?"	V11	48
WHY HAVE THEY NOT AS GOOD A	FREE AS MEN? AND, IF THEY ARE,	V11	49
WHY NOT? IS IT NOT ALLOWED, IS IT NOT	MAN, WOMAN, AND CHILD?	V11	48
WILL	POWER TO KING CHARLES THE SECOND AT THE RESTORATION." I	V11	51
WILL	ONE SINGLE CONSIDERATION, IF WE DWELL A LITTLE UPON IT,	V11	52
WILL ANY ONE SAY, HE WAS THE ONLY GOVERNOR FOR THESE		V11	52
WILL ASK, "WHO ARE THE PEOPLE?" ARE THEY EVERY	TERM. SOME	V11	48
WILL BE SO	EDWARD THE FOURTH, OR HENRY THE SEVENTH? WHO	V11	51
WILL LEAVE	IF YOU EXCLUDE ALL WHO HAVE NOT THIS WISDOM, YOU	V11	49
WILL NOT	HONK AND FIFTEEN THOUSAND SOLDIERS. "HOWEVER, YOU	V11	51
WILL NOT DENY THIS."	THEY TOOK IT AWAY FROM HIM. SURELY, YOU	V11	51
WILL NOT SAY THAT WILLIAM THE	POSSIBLY ALLOW IT. ALTHOUGH I	V11	51
WILL SAY, "BUT IF THE	KING JAMES THE FIRST? PERHAPS YOU	V11	51
WILL YOU PROVE THAT SEVEN OR EIGHT HUNDRED PERSONS	OF LOGIC	V11	51
WILL. THEREFORE THIS BOASTED PRINCIPLE	NOR PROBABLY EVER	V11	53
WILL; I DENY IT UTTERLY. THE PEOPLE OF ENGLAND NO	INDEED I	V11	51
WILLIAM AT THE	DENY THAT THE PEOPLE GAVE THE POWER TO KING	V11	51
WILLIAM THE	POSSIBLY ALLOW IT. ALTHOUGH I WILL NOT SAY THAT	V11	51
WILLIAM THE CONQUEROR? DID	THEY CHOOSE, TO GO NO FARTHER,	V11	51
WILLIAM THE FIRST DID;	THIRD OBTAINED THE ROYAL POWER AS	V11	51
WISDOM	NOT LIVED ONE-AND-TWENTY YEARS? "WHY, THEY HAVE NOT	V11	49
WISDOM AND EXPERIENCE ARE NOTHING TO	FEW BEHIND. BUT, (2.)	V11	49
WISDOM, YOU WILL LEAVE	IF YOU EXCLUDE ALL WHO HAVE NOT THIS	V11	49
WISER HEATHENS BEING	GOVERNOR OF THE WORLD HAS, EVEN THE	V11	52
WITH HIS CONSENT; FOR NO MAN HAS A RIGHT TO DISPOSE	NO, NOR	V11	52
WITH IT.	FALLS TO THE GROUND, AND THE WHOLE SUPERSTRUCTURE	V11	53
WITH REGARD	CONSEQUENCE, A LAW MADE WITHOUT HIS CONSENT IS,	V11	50
WITH SUCH CONFIDENCE, AS UNDENIABLE AND	BEEN PALMED UPON US	V11	50
WITH THAT SUPPOSITION, DEBAR EITHER WOMEN OR MINORS FROM		V11	49
WITH THE	LONG A SUBJECT OF DEBATE. AND IT HAS BEEN DEBATED	V11	47
WITH THE	CIVILIZED NATION. AND IT IS USUALLY ESPOUSED	V11	48

WITH THE PEOPLE, DURING THE LATER AGES OF THE	MANY STRUGGLES	V11	47
WITH THEM, AND THE CONDITIONS ON WHICH IT IS	BE ENTRUSTED	V11	48
WITH; IT BEING SO	COMPANIES BE RATHER HOOTED AT THAN ARGUED	V11	48
WITHOUT	TO HIM, NULL AND VOID. YOU CANNOT SAY OTHERWISE	V11	50
WITHOUT HIS CONSENT IS, WITH REGARD	CONSEQUENCE, A LAW MADE	V11	50
WOMAN, AND CHILD, HAVE A VOICE IN	THEN SHOULD NOT EVERY MAN,	V11	48
WOMAN, AND CHILD? WHY NOT? IS IT NOT ALLOWED, IS IT NOT	MAN,	V11	48
WOMEN ALSO; NOR ONLY TO ADULT MEN AND	TO MEN ONLY, BUT TO	V11	53
WOMEN ARE NOT NATURALLY AS	WHAT ARGUMENT DO YOU PROVE THAT	V11	49
WOMEN OR MINDORS FROM	WITH THAT SUPPOSITION, DEBAR EITHER	V11	49
WOMEN, AND CHILDREN,	PROPERLY SPEAKING, THAT IS, MEN,	V11	52
WOMEN, TO THOSE WHO HAVE LIVED ONE-AND-TWENTY YEARS, BUT TO		V11	53
WORD, THE PEOPLE, YOU MEAN ONLY AN	(EVEN SUPPOSE BY THAT	V11	51
WORLD HAS, EVEN THE WISER HEATHENS BEING	GOVERNOR OF THE	V11	52
WORLD, FROM THE EARLIEST ANTIQUITY; AS IN	THE WHOLE EASTERN	V11	46
WORSE	FREEHOLDERS, UNLESS THEY HAVE FORTY SHILLINGS A YEAR."	V11	49
WORSE. AFTER DEPRIVING HALF THE HUMAN SPECIES OF THEIR	AND	V11	49
WOULD HAVE BEEN AN ODDIOUS TITLE; YET CERTAIN IT IS, THAT HE		V11	51
WOULD IN MOST	HENCE IF ANY MAN AFFECTED TO DENY IT, HE	V11	48
XIII. 1.) THERE IS NO	ARE ORDAINED OF GOD." (ROM.	V11	47
YEA,	WHAT PRETENCE HAVE WE FOR EXCLUDING MEN LIKE OURSELVES,	V11	49
YEA,	THE PEOPLE BECAUSE HE HAS NOT FORTY SHILLINGS A YEAR;	V11	50
YEA, OR THE WHOLE PARLIAMENT; BY WHAT RULE	HOUSE OF COMMONS,	V11	51
YEAR." HORSE	FREEHOLDERS, UNLESS THEY HAVE FORTY SHILLINGS A	V11	49
YEAR; YEA,	THE PEOPLE BECAUSE HE HAS NOT FORTY SHILLINGS A	V11	50
YEARS ALLOWED TO CHOOSE THEIR OWN	LIVED ONE-AND-TWENTY	V11	49
YEARS OF THE PEOPLE OF ENGLAND'S	IN ABOVE SEVEN HUNDRED	V11	52
YEARS. I ASK, THEN, WHEN AND WHERE DID THE PEOPLE OF ENGLAND		V11	51
YEARS;	AND-TWENTY	V11	49
YEARS, BUT TO	WOMEN, TO THOSE WHO HAVE LIVED ONE-AND-TWENTY	V11	53
YEARS, WHO HAS HAD A PROPER RIGHT TO THE SUPREME	THOUSAND	V11	52
YEARS? "WHY, THEY HAVE NOT WISDOM	NOT LIVED ONE-AND-TWENTY	V11	49
YET A	PEOPLE; IF WE MEAN THEREBY, THOUGH NOT ALL THE PEOPLE,	V11	52
YET CERTAIN IT IS, THAT HE	WOULD HAVE BEEN AN ODDIOUS TITLE;	V11	51
YET HE MUST NOT BE NUMBERED AMONG THE	FIFTY FREEHOLDERS, AND	V11	50
YET NOT ALTOGETHER ON THIS	BIRTHRIGHT FOR WANT OF MONEY!	V11	50
YNCAS	POWER BEING LODGED IN THE EMPORER OF MEXICO, AND THE	V11	4
YOU AVER,	OR ASKED? IF NOT, WHAT IS THAT LAW TO HIM? NO MAN,	V11	50
YOU CALL THE PEOPLE OF	KNOW NOT WHAT FIGURE OF SPEECH,	V11	50
YOU CANNOT SAY OTHERWISE WITHOUT	TO HIM, NULL AND VOID.	V11	50
YOU EXCLUDE A MAN FROM BEING ONE OF	THIS? BY WHAT RIGHT DO	V11	50
YOU EXCLUDE ALL WHO HAVE NOT THIS WISDOM, YOU WILL LEAVE	IF	V11	49
YOU EXCLUDE ONE OR TWO MILLIONS MORE. AT	MILLIONS OF PEOPLE,	V11	50
YOU EXCLUDE THREE-	A THIRD, SUPPOSE TWO MILLIONS LEFT,	V11	50
YOU HAVE PUT THE MATTER UPON ANOTHER ISSUE. ARE	THE PURPOSE.	V11	49
YOU MEAN GENERAL	ALLOW NO SUCH THING; UNLESS BY THE PEOPLE	V11	51
YOU MEAN ONLY AN	(EVEN SUPPOSE BY THAT WORD, THE PEOPLE,	V11	51
YOU PROVE THAT WOMEN ARE NOT NATURALLY AS	WHAT ARGUMENT DO	V11	49
YOU PROVE THAT SEVEN OR EIGHT HUNDRED PERSONS	OF LOGIC WILL	V11	51
YOU ROB OTHERS (PROBABLY SOME HUNDRED THOUSANDS) OF THEIR		V11	50
YOU WILL LEAVE	IF YOU EXCLUDE ALL WHO HAVE NOT THIS WISDOM,	V11	49
YOU WILL NOT	MONK AND FIFTEEN THOUSAND SOLDIERS. "HOWEVER,	V11	51
YOU WILL NOT DENY THIS."	THEY TOOK IT AWAY FROM HIM. SURELY,	V11	51
YOU WILL SAY, "BUT IF THE	KING JAMES THE FIRST? PERHAPS	V11	51
YOUNG FISHERMAN. BUT	ANIELLO, (VULGARLY CALLED MASANELLO,) A	V11	52

YOUR ORIGINAL SUPPOSITION, IT CAN HAVE NO POWER OVER	NOT, BY	V11	49
1.) THERE IS NO	ARE ORDAINED OF GOD." (ROM. XIII.	V11	47

The KWIC index produced by TUIT is not organized "traditionally." In the past the print line of KWIC indices was printed with the keyword (the word being indexed) displayed down the middle of the page with the related context on either side. TUIT, however, lists the keywords down the left side of the page. Words appearing before the key word are located at the end of the print line with a definite break of several spaces to indicate where the material begins. In Figure 1 the "Vnn nn" represents volume and page references to the Zondervan reprint of Wesley's Works and were located in columns 73-80 of the TUIT records.

The value of a KWIC index is that the word indexed is placed in the context of the line in which it falls. It is immediately apparent, therefore, how the word is being used. In actual practise, of course, we may not wish to have all instances of the word "a" or "the" indexed and, as a result, many indexing programs, including TUIT, provide the option to include a list of words which will not be indexed or a list of only those to be indexed.

A somewhat more standard approach to indexing is a Keyword Out of Context (KWOC) index. With a KWOC index each word, along with the reference (page and/or volume) information is printed. Like the KWIC index, we can provide a list of words which will not be indexed. Thus, by using another simple setup, we can generate a comprehensive index of the following sort:

Figure 2
Sample KWOC Index
Wesley - Thoughts Concerning the Origin of Power

A	V11	46	V11	46	V11	47	V11	47	V11	47	V11	47
	V11	47	V11	47	V11	48	V11	48	V11	48	V11	48
	V11	49	V11	49	V11	49	V11	49	V11	49	V11	49
	V11	49	V11	49	V11	50	V11	50	V11	50	V11	50
	V11	50	V11	50	V11	50	V11	50	V11	50	V11	50
	V11	50	V11	50	V11	50	V11	51	V11	51	V11	51
	V11	51	V11	51	V11	52	V11	52	V11	52	V11	52
	V11	52	V11	52	V11	52	V11	52	V11	52	V11	52
	V11	52										
ABLE	V11	49										
ABOVE	V11	48	V11	52								
ABSOLUTE	V11	46										
ABSOLUTELY	V11	52										
ABSURD	V11	48										
ABYSSINIA	V11	46										
ACCOUNT	V11	47	V11	50								
ACKNOWLEDGE	V11	47										
ACRES	V11	50										
ACT	V11	52										
ACTION	V11	48										
ACTIONS	V11	48										
ADD	V11	52										
ADULT	V11	53										
ADVENTURERS	V11	46										
AFFAIR	V11	51										
AFFAIRS	V11	52										
AFFECTED	V11	48										
AFFIRM	V11	50	V11	51								
AFFIRMED	V11	48										
AFRIC	V11	46										
AFTER	V11	46	V11	47	V11	49	V11	49				
AGAINST	V11	47										
AGE	V11	48	V11	49								
AGES	V11	46	V11	47	V11	47						
AGREE	V11	47										
ALL	V11	46	V11	46	V11	47	V11	48	V11	48	V11	48
	V11	48	V11	48	V11	48	V11	48	V11	49	V11	49
	V11	49	V11	49	V11	49	V11	50	V11	50	V11	50
	V11	52	V11	52	V11	53						
ALLOW	V11	51	V11	51	V11	51						
ALLOWED	V11	48	V11	49	V11	52						
ALMOST	V11	46	V11	48								
ALONE	V11	48	V11	52	V11	53						
ALSO	V11	46	V11	53								
ALTHOUGH	V11	51	V11	51								
ALTOGETHER	V11	50										
AMERICA	V11	46										
AMONG	V11	50	V11	50								
AN	V11	46	V11	47	V11	48	V11	49	V11	49	V11	50
	V11	50	V11	51	V11	51	V11	52				
ANCIENT	V11	46	V11	47	V11	52						

YEARS	V11	49	V11	49	V11	49	V11	51	V11	52	V11	52
	V11	53										
YES	V11	51										
YET	V11	50	V11	50	V11	51	V11	52				
YNCAS	V11	46										
YOU	V11	49	V11	49	V11	49	V11	49	V11	50	V11	50
	V11	50	V11	50	V11	50	V11	50	V11	50	V11	50
	V11	51	V11	51	V11	51	V11	51	V11	51	V11	51
	V11	51										
YOUNG	V11	52										
YOUR	V11	49	V11	50								
1	V11	46	V11	47	V11	49						
10	V11	48										
11	V11	48										
12	V11	49										
13	V11	49										
14	V11	50										
15	V11	50										
16	V11	50										
17	V11	50										
18	V11	51										
19	V11	52										
2	V11	46	V11	49								
20	V11	52										
21	V11	52										
3	V11	46										
4	V11	47										
5	V11	47										
6	V11	47										
7	V11	47										
8	V11	48										
9	V11	48										

A byproduct of the KWOC index is the ability to obtain a list of all the words in the text being analyzed sorted into order by frequency of occurrence. Such a list can be useful when evaluating themes within a text or comparatively across different texts. An example of such a listing is the following:

Figure 3
Wesley - Thoughts Concerning the Origin of Power

WORDS LISTED IN ORDER OF FREQUENCY

THE	184
OF	113
TO	68

AND	66
NOT	62
IS	55
IN	53
A	49
IT	49
BUT	45
POWER	43
THAT	42
BY	39
PEOPLE	38
THEY	38
HAVE	36
ARE	35
THIS	28
AS	27
OR	25
NO	23
ALL	21
I	21
OWN	21
RIGHT	21
HAS	20
WHAT	20
THEIR	19
YOU	19
ONE	18
WE	18
ANY	17
FROM	17
HE	17
MAN	16
WHO	16
BE	15
DID	15
HIS	15
FOR	14
IF	14
SO	14
WHICH	14
WILL	14
AT	13
CONSENT	13
EVERY	12
MEN	12
THEM	12
BEEN	11
CAN	11
AN	10
ENGLAND	10
GOVERNORS	10
ONLY	10
SUPREME	10
WITH	10
CHOOSE	9

HAS	9
LAW	8
ON	8
SUPPOSE	8
BEING	7
EITHER	7
HUMAN	7
HUNDRED	7
KING	7
LIFE	7
MORE	7
NATURE	7
NOR	7
OVER	7
QUESTION	7
THEN	7
THOSE	7
UPON	7
WERE	7
YEARS	7
ANOTHER	6
DENY	6
DO	6
EXCLUDE	6
GAVE	6
LET	6
LIVED	6
LODGED	6
MANY	6
MATTER	6
MEAN	6
NONE	6
TAKE	6
THERE	6
THEREFORE	6
.	
.	
.	
.	
SPEECH	1
STATE	1
STEPHEN	1
STEPS	1
STIFF	1
STROKE	1
STRONGEST	1
STRUGGLES	1
STYLED	1
SUBORDINATE	1
SUBSISTED	1
SUBSISTS	1
SUCCEEDED	1
SUFFRAGE	1
SUPERSTRUCTURE	1
SUPPOSED	1

SURE	1
SURELY	1
SWALLOWED	1
TENS	1
TERM	1
TERMED	1
THEREBY	1
THEREIN	1
THERewith	1
THING	1
THOMAS	1
THOUGHTS	1
THREE	1
THREE-	1
THREESCORE	1
THROW	1
THUS	1
TIBERIUS	1
TIME	1
TIMES	1
TITLE	1
TOGETHER	1
TOLERABLE	1
TOWARD	1
TRUE	1
TRULY	1
TRY	1
ULTIMATELY	1
UNDECIDED	1
UNDERSTAND	1
UNDERSTANDING	1
UNITED	1
USE	1
USING	1
UTMOST	1
VARIETY	1
VARIOUS	1
VENICE	1
VOGUE	1
VOID	1
VOTERS	1
VOTES	1
VULGARLY	1
WARMTH	1
WAY	1
WHEN	1
WHEREEVER	1
WHEREIN	1
WISER	1
XIII	1
YES	1
YOUNG	1
YUCAS	1
10	1
11	1

12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1

As a final example, we might find it useful to know something about the complexity of a text. A number of "readability" measures have been constructed which measure, according to mid to late twentieth century standards, of course, the grade level required to comprehend a given text. Such measures are used to insure that reading material is pegged correctly to a target audience. While there are a number of measures (and TUIT computes most of them), many of them are based on such factors as sentence length, number of polysyllabic words, and the like. The Fog Index is one measure of readability. The index is stated in terms of the grade level needed to comprehend the material. The recalculated index is an effort to standardize the Fog Index against other readability scores. Figure 4 is a summary of Thoughts Concerning the Origin of Power in terms of the components of the text along with the Fog Index.

Figure 4
Readability Scores
Wesley - Thoughts Concerning the Origin of Power

READABILITY SCORES			
THE FOLLOWING READABILITY SCORES ARE CALCULATED—			
FOG			
WHERE APPROPRIATE, BOTH THE ORIGINAL FORMULA AND			
THE POWERS, SUMNER, KEARL RECOMPUTATION ARE CALCULATED.			
THE FOLLOWING VALUES ARE USED—			
NUMBER OF SYLLABLES—	4,246		
NUMBER OF ONE SYLLABLE WORDS—	2,041		
NUMBER OF TWO SYLLABLE WORDS—	628		
NUMBER OF THREE SYLLABLE WORDS—	95		
NUMBER OF WORDS EXCEEDING THREE SYLLABLES—		86	
TOTAL NUMBER OF WORDS—	2,974		
NUMBER OF SENTENCES—	81		
FOG	10.3320	RECALCULATED	5.4339

Although eighteenth century writing styles often seem somewhat stilted to twentieth century readers, at least from the standpoint of formal complexity, Thoughts Concerning the Origin of Power is not a difficult text to read. This perspective is substantiated by a Fog Index of 10.332 (years of education) needed to comprehend the document. We should not forget, however, that illiteracy was rampant in the England of Wesley's day and it is necessary to interpret measures like the Fog Index with some caution. It should be possible, however, to structure similar indices which would be appropriate measures of eighteenth century writing, and comparative data with other writers would help us peg Wesley as a writer. This issue might be of particular interest considering the fact that Wesley's movement was directed, if not to the lowest classes of England's social structure, at least to some of the lower levels.

Informational and Database Needs

Clearly computers can be used in the analysis, editing, and manipulation of textual materials as well as for numerical and statistical analysis. But can it be done easily? As illustrated above it can be done with at least moderate ease, and some of the appropriate software is available, either for microcomputers or (as with TUIT) for large mainframe computers. To make the process of computer assisted analysis of historical materials more easily available to a wide community of scholars, however, some additional development must take place. In particular, there should be some additional software development, and there must be some collective effort to translate bodies of materials into machine readable form.

Software Needs

Although there is an ever increasing amount of software (computer programs) available for the manipulation of text, much of the current development comes from the needs for increasing levels of office automation. Many of the word processing systems currently on the market can be used "off the shelf" to assist with the manipulation of text. Moreover, with the archiving of historical data such as census data and voting records, more and more information traditionally used in history and the humanities is being made available to scholars. Much of the development of both software and data resources can be traced in the pages of a journal called Computers and the Humanities. Increasingly, however, more popular computer oriented magazines are featuring articles which should be of interest to traditional scholars.

In the area of textual analysis, however, additional software would be desirable. In particular, specialized text editors which would assist in the generation of notes (not just computerized note-taking programs), in the sorting of notes, and in the decomposition of text for content analysis would be useful. That development is unlikely to come about, however, until scholars in the humanistic disciplines develop greater acceptance of computers as an aid to humanistic research. Conversely, such software development is not likely to take place without the active endorsement of groups concerned with specific areas of interest. An example would be the general area of Wesleyan studies. The fact must be faced that much software development, even in universities, is a function of demand (or the market, if you will). Software will not be developed if there is not a perceived market for the product.

Data Resources

Even though some additional software development would be desirable, the fact is that there is a considerable amount of "off the shelf" software already in existence. What is not available in many areas of study, especially those needing textual information, is a corpus of machine readable documents. Again, a good example is the area of Wesleyan studies. A concerted effort to reduce Wesley's works to machine readable form would have many beneficial results. An immediate and obvious byproduct of that effort would be faster production of new editions of the texts.

If Wesley's works were to be entered by traditional data entry techniques with people keying in the text, the cost works out to two to three dollars (U.S.) per page of the Zondervan edition. There are automated techniques for translating text to machine readable form, however. One

machine, manufactured by Kurzweil, Inc., can read most English type fonts used over the past two centuries or so. Consequently, it would be possible to rent time on such machines and generate machine readable versions of Wesley's works. If such a project were to ever get off the ground, some standardized format would have to be developed and a standard approach to distribution established. At some point just after the middle of this decade it might be possible to use video laser disks as the medium of exchange and the entire Wesleyan corpus could be placed on a single disk. In the meantime a standard "floppy disk" format might be appropriate. The problem requires some forethought and some funding, but the problems are certainly not insurmountable.

Similarly, a machine readable bibliographic database would be very helpful to scholars in specialized fields. In areas such as Wesleyan studies the appropriate approach might well be a system based on microcomputers using "off the shelf" data management software for retrieval. It is possible that such an effort in automated bibliographic systems could become a byproduct of specialized publications since we are certainly not dealing with topics for which there is a mass market. Because there is not a mass market it is absolutely essential for scholars in specialized fields to obtain some kind of organizational support if ongoing updating of resources is to take place. Within the context of a network of scholars, however, if a standardized format for bibliographic resources were adopted, it would be possible to generate a significant amount of data at a relatively low cost. Some organizing agency would still be required, however.

Suffice it to say, however, that computers lie in the future of even the most tradition bound disciplines. It does not make a great deal of sense to continue to do time consuming tasks with any but the best tools. Computers from the smallest to the largest provide a new set of information processing tools as did the technologies of writing and printing in other eras. To use computers effectively it is not necessary, nor even necessarily desirable, for everyone to become a computer expert. To use a typewriter effectively, after all, it is not necessary to know how to build one. On the other hand, tools like computers cannot be used well if we restrict our imaginations and refuse to recognize the role computers can play regardless of our discipline. We have before us today the relatively cheap availability of one of the more powerful tools yet developed--we should try to use it effectively.

ERRATA

Computer Use in History and the Humanities

by Thomas Wm. Madron

Page 2, sentence beginning on line 17 implicitly citing Wesley's A Compendium of Logic (1750) and incorrectly suggesting that it was Wesley's first book. Alas, another indication that we should not rely on memory for documenting dates.

Page 4, line 18, Microcomputers rather than Microcomputer.

Page 5, line 21, change "can" to "came".

Page 7, line 17, "... such as the Inter-University Consortium for Political and Social Research ..."

Page 9, line 3, remove the word "and" at the beginning of the line.

