AN ANCESTRAL LINES PAIRING SYSTEM

Uniquely Numbering Each Ancestral Line, Generation, Pairing and Sibling

Ancestral Lines is an interesting new development supporting our family history and genealogy community. It’s a free opportunity that will involve only as much time as you choose to spend learning and working with it…

A new pedigree numbering system – called Ancestral Lines, for short – has been developed as an alternative approach that visibly displays the ancestral lines and generations of all direct ancestors in multiple presentation formats. This follows straightforward genealogical thinking and addresses important needs in selecting your numbering system. It is freely available for personal record-keeping, research, education and other non-commercial uses.

The initial disclosure of this system is an article published online by the New England Historic Genealogical Society (NEHGS), which can be accessed free of charge in their "Expert Exchange" section at www.americanancestors.org. Please take a few minutes to read the published introduction for this on the following pages. Then certainly consider accessing the extended PDF version through the NEHGS Website. This contains many useful examples and detailed explanations of underlying calculations – particularly useful for prospective developers! Perhaps then contribute your own ideas and comments through their Website concerning the new system and it’s apparent benefits.

Other useful information and opportunities to learn and contribute are available through the Ancestral Lines Website, www.ancestrallines.net, where, among other things, we announced plans for the interaction during RootsTech 2012. We also provide some brief video introductions to Ancestral Lines, a "Features and Benefits" outline for both users and developers (reproduced below), results for a recent survey for work with ancestral lineages and pedigrees (also below), and opportunities for you to contribute your own ideas.

Please note that Ancestral Lines is mathematically based and efficiently computerized. It may readily be licensed for commercial purposes, with more information available on the Ancestral Lines Website.

Thanks for your interest. I look forward to seeing you during RootsTech!

Capers W. McDonald
Creator, Ancestral Lines Pairing System

NEHGS article Website *introduction* attached (with permission). Ancestral Lines “Features and Benefits” table and 2011 Survey findings also attached.
An Ancestral Lines Pairing System:

Uniquely Numbering Each Ancestral Line, Generation, Pairing and Sibling

Capers W. McDonald

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A new ancestral numbering system has been developed that visibly displays component lines and generations of pedigrees in either text or chart formats. This “Ancestral Lines Pairing System” meets essential requirements of being easy to read and understand while maintaining the integrity of its unique indicators, and of recording relationships briefly with as much useful information as possible.

All ancestors are individually numbered without first compiling a comprehensive set or naming every individual. The new system first organizes and numbers each direct Line in a manner ideally suited to presenting these as continuous ancestral lineages – setting and maintaining the direct “ancestor line” numbers. It next visibly numbers successive Generations along each Line as simply as possible, with each father’s and mother’s Generation number always being one greater than the Generation number of their children. Line numbers are added in the new system at one half the rate individuals are added in the Ahnentafel method, and these smaller numbers continue to be used into the deeper ancestries. These therefore are not merely “index” locator numbers; they also visibly convey additional information beginning with the individual’s family line and generation.

The Ancestral Lines Pairing System – Ancestral Lines for short – is particularly well suited for displaying ancestral lineages in a variety of formats. These reflect some of the more important considerations a genealogist should address in selecting and applying a numbering system. The Initial Lines and Generations calculated for direct ancestors, displayed in a straightforward two-number format, can be used effectively in many applications.

The next important alternative to consider is to build on this basic framework in a three-number format and uniquely number all Siblings and paternal or maternal half-Siblings of the direct ancestry consecutively. This assigns Sibling numbers continuously through all ancestral Pairings, using numbers representing temporal or other rankings appended to the calculated Line and Generation numbers of each direct Line. This fundamental alternative is particularly satisfactory for presenting any pedigree of direct ancestors and their full Siblings. However, by numbering all offspring consecutively, it excludes visibly identifying half-Siblings as being from collateral, non-ancestral Pairings.

To fully account for Sibling relationships, there is the option first to number all the Pairings of each direct ancestor and thereafter number all offspring as Siblings within their Pairing. With this alternative, a four-number format assigns a number for each Pairing by Line and Generation in the entire collateral family, and then assigns a number for each Sibling within their nuclear family. This extended approach most clearly identifies different Pairings as well as the half-Siblings of collateral Pairings, of which there may be several in any Generation, both paternal and maternal.

Ancestral Lines readily supports both the Y-DNA and mtDNA studies often paired with traditional family research. These two distinct ancestral lineages are prominent and easily followed in the new system. Patrilineal Line 1 conveniently always represents the Y-DNA line, and Ancestral Lines’ straightforward Generational numbering matches with the testing companies’ and others’ supporting software formats that indicate the probabilities of when a Most Recent Common Ancestor (MRCA) is shared.
Ancestral Lines is mathematically based and readily computerized. Numbers given to the Maternal Lines paired in each Generation are equal to the partner’s Paternal Line number plus a consistent “Generation Constant.” This added number increases for all Lines in each ancestral Generation, growing as should be expected as multiples (or powers) of the “coupling” number, two.

OVERVIEW

When working with ancestral lineages, both professional and non-professional genealogists most often deal with family “lines” and “generations.” However, there is no accepted ancestral numbering system that addresses this apparent need to reliably assign and clearly indicate both lineage and generational information. This is particularly concerning, since it has been acknowledged for decades that the “selection of a numbering system is one of the key decisions the writer of a family history will have to make. It should, therefore, be made with care.”

The widely-used Ahnentafel method of sequentially numbering individuals in ancestral pedigrees does not directly indicate antecedent lines or generations. This also is the case for the Dollarhide and similar approaches, most derived from the Ahnentafel indexing method. Until now, there has been no generally accepted mathematically-based alternative to Ahnentafel numbering.

In many endeavors, specific precursors, "lines of reasoning" or "sequences of information" give rise to the need to uniquely identify all contributors and how each is correlated with another in a primary, secondary or more distant relationship. In all cases, maintaining the integrity of the relevant "lines" or "sequences" is paramount, and recording the relationships to indicate succinctly as much useful information as possible is always important and usually the basis of any systematic approach to record keeping.

An improved ancestral numbering system is needed that, at a minimum, displays component lines and generations. Any such new system must meet the more general requirements of being easy to read and understand, and of recording relationships briefly with as much useful information as possible, while maintaining the integrity of its indicators. To complete this undertaking, the new system also should provide options to informatively record the entire collateral family, uniquely assigning individual numbers for ancestral pairings and siblings comprising each nuclear family.

An "Ancestral Lines Pairing System" therefore has been developed for uniquely numbering each ancestral line, generation, pairing and sibling in any genealogical record. Called Ancestral Lines for short, it was developed by the author, Capers W. McDonald, beginning in 1984, with expansion and descriptive updates since.

A NEW ANCESTRAL NUMBERING SYSTEM

The Ancestral Lines Pairing System is an antecedent pairs numbering system that is designed to consistently calculate and clearly display both lineage and generational information reliably and succinctly. It also enables users to account for all members of each nuclear family, including all pairings and the siblings or half-siblings of collateral partners.

Most generally, Ancestral Lines is a method for representing genealogical information in a mathematical array by ordering and numbering direct ancestors and their siblings. This information can be presented coherently in text or book formats as well as in tabular or other diagrammatic forms.

With Ancestral Lines, ancestors are individually numbered without first compiling a comprehensive set or definitively naming all individuals, requiring only connecting how each relates to a selected descendant or another known ancestor. Complex relationships among ancestors – such as generation intervals for Y-DNA analyses; maternal line tracing with mtDNA implications; how generations in different lines share time periods; or clear indications of generations and pairing order for half-siblings – readily are ascertained based on this numbering.
Two types of numerical records constitute *Ancestral Lines*. First, relationships are calculated for all direct ancestral Lines and Generations, and then individuals can be assigned numbers relative to their Pairings and Siblings.

Figure One shows an example of a pedigree chart of four generations in a well-known early American family using *Ancestral Lines* numbering.

The initial Line and Generation numbering relationships for *Ancestral Lines* are shown in Figure Two. The inherent symmetry of the newly numbered Lines appearing in each Generation is shaded, to emphasize how both the relative positions or "branching" of these, as well as the sequence of Generations along each Line, are systematically organized to provide the most useful information in a basic format.
SIBLING ASSIGNMENTS IN A THREE-NUMBER FORMAT

A three-number format of *Ancestral Lines* assigns Sibling numbers continuously through all ancestral Pairings. In this approach, a number representing temporal or other ranking based on birth date or other information for each Sibling is appended to the first two, calculated Line and Generation numbers of each Paternal Line. For example, as shown in Figure Three, the first and second Siblings born in direct Paternal Line 7 in Generation 4 for another well-studied early American family would be numbered 7.4:1 and 7.4:2, respectively. This fundamental, three-number format is particularly satisfactory for presenting any ancestral pedigree of direct ancestors and their full siblings, but excludes visibly identifying half-siblings as being from collateral pairings.

The extended, four-number format of *Ancestral Lines* assigns numbers for both Pairings and Siblings, thereby providing the inherently valuable indication of different marriages or other Pairings, as well as clearly identifying half-siblings of collateral partners. For additional insights into all of these numbering relationships, please see the Portable Document Format (PDF) version of this article.

### Figure Two

**Initial Line and Generation Numbering in the Ancestral Lines Pairing System**

<table>
<thead>
<tr>
<th>GENERATION</th>
<th>BEGINNING DESCENDANT</th>
<th>ANCESTORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.1</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4</td>
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<tr>
<td>2</td>
<td></td>
<td>5.4</td>
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<tr>
<td>3</td>
<td></td>
<td>3.3</td>
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<tr>
<td></td>
<td></td>
<td>3.4</td>
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<tr>
<td>4</td>
<td></td>
<td>7.4</td>
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<tr>
<td>5</td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ALL LINES:**

| 1 | 2 | 4 | 8 |
Figure Three

Book Format Example
Using a Three-Number Ancestral Lines Pairing System

Line 7: WHITE

Generation 4

7.4: 2 ESTHER WHITE, born ca. 1685 and died at Warwick RI, 23 July 1738.  
She married (1) at Yarmouth, 7 Nov. 1707, 3.4.0 John Joyce, d. Yarmouth 10 Jan. 1714/5.

Generation 5

7.5: 3 JONATHAN WHITE, born at Marshfield 4 June 1658 and died at Yarmouth bet. 14 July 1736  
and 22 Feb. 1737. He married (1) at Yarmouth, 2 Feb. 1682/3,  
15.5: 0 HESTER NICKERSON, born at Yarmouth the last week of Oct. 1656 and died there 8 Feb. 1702/3.

Children of 7.5:3 Jonathan and 15.5:0 Hester (Nickerson) White, all probably born Yarmouth:

7.4: 1 ELIZABETH WHITE, living unmarried 14 July 1736.  
7.4: 2 ESTHER WHITE, b. ca. 1685; m. 3.4.0 John Joyce.  
7.4: 3 SARAH WHITE, no children found.  
7.4: 4 JONATHAN WHITE, "oldest son" in father's will.  
7.4: 5 EBENEZER WHITE, b. 9 Aug. 1698.  
7.4: 6 JOSEPH WHITE, b. ca. 1702.  
7.4: 7 MARY WHITE, b. prob. Bef. 1703.

Generation 6

7.6: 2 PEREGRINE WHITE, born aboard the Mayflower at Provincetown Harbor before end of Nov. 1620  
and died at Marshfield 20 July 1704. He married before 6 March 1648/9,  
23.6: 0 SARAH BASSETT, born at Plymouth ca. 1630 and died at Marshfield 22 Jan. 1711.

Children of 7.6:2 Peregrine and 23.6:0 Sarah (Bassett) White are:

7.5: 1 DANIEL WHITE, b. ca. 1649.  
7.5: 2 [--?--], born ca. 1650/1.  
7.5: 3 JONATHAN WHITE, b. Marshfield 4 June 1658.  
7.5: 4 PEREGRINE WHITE, b. ca. 1661.  
7.5: 6 SYLVANUS WHITE, b. Marshfield bef. 1667.  
7.5: 7 MERCY WHITE, b. ca. 1670.

Generation 7

7.7: 0 WILLIAM WHITE, born in probably England and died at Plymouth 21 Feb. 1620/1.  
He married, perhaps about 1614,  
39.7: 0 SUSANNA [--?--], born in probably England and died between 18 Dec. 1654 and 2 July 1675.  

Children of 7.7:0 William and 39.7:0 Susanna [--?--] White are:

7.6: 1 RESOLVED WHITE, b. in Holland or England prob. ca. 1615; m. (1) Judith Vassall.  
7.6: 2 PEREGRINE WHITE, b. aboard Mayflower at Provincetown Harbor bef. end Nov. 1620.

ORGANIZATION OF ANCESTRAL LINEAGES

By design, Ancestral Lines organizes and numbers each direct line in a manner ideally suited to presenting these as continuous family lineages. For example, the first 16 of these lines comprise a compelling start to almost any ancestral pedigree. Completing these through their inherent first four
generations of ancestry could be an initial goal for many researchers – one that might take years to reach or, for some, be found to be unreachable.

For better-known ancestries, with perhaps centuries of development behind them, the initial 16 lines still could serve as the beginning of a much longer and broader genealogical journey. One presentation, for example, would be a variation of the “multi-surname approach” described by Curran for the “writer who chooses to group his ancestral lines by surname, presenting them one at a time…” [12] Alternatively, after presenting these first 16 as deep lineage chapters, the genealogist could group all other lines first appearing in the earlier cohorts by generation, similar to a traditional Ahnentafel, but with considerably easier reference to the relationships of the first numbered lineages as well as to other lines and each numbered generation. Several other presentation formats also are possible.

View an expanded version of this article as a PDF document.

Enjoy this article? Have questions or comments? Submit your feedback!

Capers W. McDonald is an NEHGS member living in Potomac, Maryland and (as often as possible) Pawleys Island, South Carolina. He is an Executive in Residence and faculty member of the Carey Business School of Johns Hopkins University and former CEO of BioReliance Corporation of Rockville, Maryland. He has been researching and collaborating on family histories and genealogies since he was in high school.

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5 John Frederick Dorman, ed., The Virginia Genealogist 37:1 (1993), 66-67, review of Numbering Your Genealogy: Sound and Simple Systems, “…the Editor…recognizes the value of adherence to standard forms and strongly recommends that anyone contemplating the publication of a genealogy should follow Mrs. Curran’s advice. The advice given here should be followed in most publications, especially when many generations of a family are to be discussed.”
9 "Numbering System for Antecedents and Outcomes," U. S. Utility Patent pending also covered by international Patent Cooperation Treaty Regulations (Washington, DC: USPTO, 2011). A specific application of this patent, the Ancestral Lines Pairing System (Ancestral Lines) is freely available for personal record-keeping, research, educational and other non-commercial uses, and readily may be licensed for commercial purposes.
## Ancestral Lines Pairing System: Top FEATURES and BENEFITS

<table>
<thead>
<tr>
<th>FEATURES (Descriptive facts)</th>
<th>BENEFITS (Mean that you will...)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Organized and numbered based on straightforward genealogical thinking</td>
<td>Uniquely number each direct ancestor by their family Line and Generation</td>
</tr>
<tr>
<td>2. Visibly display component Lines and Generations in any pedigree</td>
<td>Immediately recognize Lines and Generations in an easy-to-read and understand format</td>
</tr>
<tr>
<td>3. More than merely index locator numbers</td>
<td>Visibly convey useful genealogical information, starting with each individual’s Line and Generation</td>
</tr>
<tr>
<td>4. Intuitive numbering of ancestral Lines</td>
<td>Begin with “Lines,” our most common interest and term for lineages in ancestral pedigrees</td>
</tr>
<tr>
<td>5. Sequential numbering of successive Generations</td>
<td>Record “Generations,” the most important temporal relationship between individuals and cohorts</td>
</tr>
<tr>
<td>6. Lines persist into deepest ancestry</td>
<td>Clearly link more recent and earlier ancestors, and use smaller early numbers into the distant past</td>
</tr>
<tr>
<td>7. Line numbers added at one-half the rate individuals added in Ahnentafel method</td>
<td>Use fewer lead reference numbers for comparable pedigrees</td>
</tr>
<tr>
<td>8. Smaller lead numbers used than for comparable Ahnentafel coverage</td>
<td>Have more easily read and recalled identifiers, with fewer digits in each comparable number</td>
</tr>
<tr>
<td>9. Alternative extended format for uniquely identifying all Siblings and half-Siblings</td>
<td>Uniquely number Siblings of each nuclear family and half-Siblings of the extended collateral family</td>
</tr>
<tr>
<td>10. Numbering independent of completeness or individual entries</td>
<td>Have no requirement for a completed pedigree or of naming every individual</td>
</tr>
<tr>
<td>11. Numbering independent of format</td>
<td>Readily use text (or book), chart, table and other graphic formats</td>
</tr>
<tr>
<td>12. Fewer different lead reference numbers</td>
<td>Visibly recognize family Lines, and more readily associate closely-related individuals</td>
</tr>
<tr>
<td>13. System readily supports Y-DNA studies</td>
<td>Use patrilineal Line 1 to represent Y-DNA line, with Generational numbering matching MRCA formats</td>
</tr>
<tr>
<td>14. Generation Constants always evident in pairings, by addition or subtraction</td>
<td>Easily number your paired maternal Line by adding a Generation Constant to existing paternal Line</td>
</tr>
<tr>
<td>15. System mathematically based, logically consistent and readily computerized</td>
<td>Use a Generation Constant that increases as multiples (or powers) of the “coupling” number two</td>
</tr>
<tr>
<td>16. Extended three-number format uniquely numbers all Siblings</td>
<td>Consecutively number all Siblings and paternal or maternal half-Siblings of direct ancestors</td>
</tr>
<tr>
<td>17. Alternative four-number format uniquely identifies all Siblings and half-Siblings</td>
<td>Clearly identify different Pairings (other marriages) as well as the half-Siblings of paternal and maternal collateral Pairings</td>
</tr>
</tbody>
</table>

18 Dec 2011
Survey Results for Work with Ancestral Lineages and Pedigrees

This December 2011 survey was intentionally brief and focused, producing four principal findings from a representative group of both professional and non-professional genealogists and family historians. These findings cover (1) openness to an alternative ancestral numbering system, (2) benefits considered most important, (3) importance of software available, and (4) software programs used or recommended most often. These findings are first summarized below and followed by a review of survey participants’ relevant experiences.

Concerning work with ancestral lineages and pedigree numbering systems, the survey consisted of nine multiple-choice questions, and responses to all of these are summarized below. Voluntary access to the survey was open for one month through both the NEHGS online article and the Ancestral Lines website, as well as in response to invitations emailed to a list of qualified professionals and private genealogists.

Adopting a Numbering System:

1. Approximately two-thirds – 68% – of survey participants overall indicated “Yes,” and 93% indicated “Yes” or “Maybe” in answer to the question, “Are you generally open to using a numbering system for ancestral Lines and Generations upon occasion, primarily as an alternative to an Ahnentafel, provided it is adequately documented and freely available?” Among survey participants who handled client assignments, over one-half – 55% – indicated “Yes” to this question, and four of five – 82% – indicated “Yes” or “Maybe.”
2. The following benefits were considered the most important by participants in adopting another ancestral numbering system. Survey participants selected these benefits from a “randomly” ordered list of 18 plus write-in for each respondent.

Top Benefits for An Alternative Numbering System

- Easy to Read and Understand Format (77%)
- Readily Computerized (71%)
- Immediately Recognize Lines and Generations (68%)
- Visibly Convey Useful Genealogical Information (65%)
- Uniquely Number Each Direct Ancestor (65%)
- Visibly Recognize Family Lines (61%)
- Uniquely Number Siblings of Nuclear Family (55%)
- Consistent and Reliable Underlying Logic (55%)
- Visibly Recognize Ancestral Generations (48%)
- Clearly Link Recent and Earlier Ancestors (48%)
- Clearly Identify Different Pairings (Marriages) (45%)

3. 65% of respondents answered “Important” or “Somewhat important,” with another 29% answering “Very important” or “Essential,” to the question, “How important would it be to you and your clients or audiences to have any new ancestral numbering system incorporated into one or more generally available genealogical software programs?”
The following genealogical or charting software programs were selected by participants as those most often used or recommend, especially for working with ancestral pedigrees or Ahnentafels: (a) Family Tree Maker (Ancestry.com), (b) RootsMagic, (c) Legacy Family Tree, (d) Personal Ancestral File (PAF), (e) The Master Genealogist, (f) Ancestry Family Tree (AFT), (g) Heritage Family Tree, (h) Brother’s Keeper. [Five percent or more of survey participants selected these programs from a "randomly" ordered list of 24 plus write-in for each respondent, although others also were selected.]

**Survey Participants’ Experience:**

A. Participants’ averaged 22 years of experience “significantly engaged in family history or genealogy,” with 36% of respondents being in the range of 16-25 years. The full range of experience was from “fewer than five” (7%) to “more than 40” years (10%).
B. Nearly all survey participants reported they had engaged in their own lineage or family research over the past several years, with 36% having had client assignments. 45% had been instructors or speakers.

C. Just over one-half of the participants reported that 30 to 50 percent of their activities or engagements over the past several years had included working with some form of ancestral pedigree or Ahnentafel. Approximately one-quarter of respondents reported more than this amount of experience, and the remaining one-quarter reported less.

D. When working with ancestral pedigrees or lineages, approximately one-half of participants indicated that in 75% or more of projects, they or their clients or audiences used the term ancestral "LINE."

E. Just over one-half of survey participants indicated that in 75% or more of projects, they or their clients or audiences used the term ancestral "GENERATION" when working with ancestral pedigrees or lineages.