This revision upgrades one area of the original article, published on pages 83-90 of the May 2003 issue of Word Ways, and clarifies another area.

**Fewest letters needed for each number of number-names**

The first list attempted to set targets for the minimum number of letters needed to construct (one at a time) any given number of the number-names from 1 to 99, and the second list set upper limits to the minima by drawing on the words found in the bulk of the article. Dan Tilque soon produced some better results for the middle of the first list (a few included in this article), which led me to a serious attempt to find all the best solutions for every number of letters from 1 to 35 (the most needed to construct every number). It was never a trivial task, and actually makes a good brain teaser, because a solution for one number of letters does not necessarily lead to the next number of letters: you may need to throw away some letters, as well as replacing them and adding one. For example, you can find the optimum for 9 letters by successively adding a letter to one of the solutions for 7 and then one of the solutions for 8, but then, and again at 13 and 14, you have to discard some letters first. Moreover, the solution for 6 produces exactly the same number-names as that for 5. Furthermore, there are often a number of equally good solutions. The original article pointed out that getting the first few solutions was straightforward, but in the end I preferred to start from the known set of 35 letters for all the 99 number-names which was printed as a note on page 84: in either case, you do not have to consider letters additional to the 35. The shortest number-names all have three letters, although one might pretend the following list should start with A and AN! This list is actually arranged by column 2 (# lets), which contains each number of letters from 3 to 35: for each of these the list gives the maximum number of number-names that can be made (#nn). For the first part of the list, there is a column headed “word”, which gives the number of letters found in the shortest words or phrases for that number of number-names. For reasons of convenience and space, the latter part of the list works by exception: only the missing names and numbers from 1-99 are listed.

Thus, alongside 10 letters in the second column, you will find two different sets of 10 letters, each set containing 9 number-names: but a 12-letter word is needed to contain this number of number-names. This list essentially replaces the first two lists and the table on pages 84 and 85 of the original. An asterisk indicates that the set of letters can make a word other than the number-name itself (only applies where the word contains the minimum number of letters for the number of number-names).

<table>
<thead>
<tr>
<th>#nn</th>
<th>#lets</th>
<th>word</th>
<th>letters required to make the number-names indicated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>ENO 1</td>
<td>ENO 1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>ENOT* 1 10</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>ENOTW* 1 2 10</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>EE</td>
<td>ENOT + any other letter makes no more number names than ENOTW, ie 1 2 10</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
<td>EINNOTW* 1 2 9 10</td>
<td>EINNOTY* 1 9 10 90</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>EGHINNTY 8 9 10 80 90</td>
<td>EINNOTYW 1 2 9 10 90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EINNSTXY 6 9 10 60 90</td>
<td>EINSTXY* 1 6 10 60 61</td>
</tr>
<tr>
<td>7</td>
<td>9</td>
<td>EINNSTXY* 6 9 10 60 69 90 96</td>
<td>EINSTXY 1 6 9 10 60 61 90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EINOTTWY 1 2 9 10 20 90 92</td>
<td></td>
</tr>
</tbody>
</table>
From here onwards, the third column is omitted since there are few relevant words, but there are phrases with 40 names in 24 letters, with 49 names in 37 letters, and with 58 in 43.

From here onwards, the letters are those omitted from the full 35-letter set, and the numbers those omitted from the set 1-99.
The number-names 1 to 99 need the letters shown:

Antidote - words which contain not one letter from any number-name, and words which do not contain any whole number name

Dan Tilque commented on the last paragraph headed Antidote (page 90): "just off the top of my head, I came up with BROADBAND, FOOLPROOF, and ABRACADABRA". He was provoked because the text was badly worded: the examples given contain just the letters ABCDJKMZ, which, along with P, are letters not used in the number-names 1 to 99. The idea was words which had no scintilla of a relationship to even a part of a number-name (ie no letter in common). On the other hand, words or phrases which contain no whole number-name are indeed abundant — well over a million. Some examples with their lengths (from the OED except where noted):

57 Al Jamahiriyah al `Arabiyah al Libiyah ash Sha’biyah al Ishtirakiyah (Libya, 25° 0' N, 17° 0' E, NIMA)

40 San Antonio Missions National Historical Park: South Central Texas, Columbia Gazetteer

31 Trelease's beavertail pricklypear (ITIS plant)

31 National Vocational Qualification (Bloomsbury Thesaurus)

30 conjunctivodacryocystostomizing: (-stomy in Stedman)

30 dulce et decorum est pro patria mori (Chambers)

29 floccinaucinihilipilification

29 floccipaucinihilipilification: (1816 quote under previous)

27 Post Traumatic Stress Disorder


27 Maurice Hugh Frederick Wilkins: Nobel laureate for DNA

23 anthropomorphologically

21 transubstantiationist

20 supercalifragilistic (OED supercalifragilisticexpialidocious)

20 indistinguishability

19 unconstitutionality

By now there are many of each length, for example 20000 or more OED headwords of length 12 like ABOLITIONIST. Before anyone spots it, I did not consider the obsolete spelling ninty!

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