TWELVE WORDS:

Numbers and units ad infinitum: T.Pendlebury.

(NB: Mr. Pendlebury uses 7 for ten and & for eleven; the standard digits Ƨ and Ɛ are used here).

The system of words: do, gro, mo, do-mo, bi-mo etc. follow the tradition of decimal arithmetic in that they give distinct names to the first three powers of the base, and then go on to use the highest as a sort of new base. A little further on the system needs a new name, and so on.

This was quite satisfactory until man evolved to the stage of using astronomical numbers. Being lost for words he then invented the method of writing numbers in the form: $6{\cdot}5 \times 10^{19}$.

How many billions or trillions in 10^{19}? And are they English or French ones? Who cares? The number tells us precisely where to put the decimal point in respect to our number, and, after all, that is all anyone wants to know.

Similarly in the dozen system we may say $*7{\cdot}8 \times 10^{23}$.

So let us have a system of words that "number" the powers of the dozen, say:

	MON	DY	TRIN	TET	QUEN	HES	SEV	AK	NEN	DEX	LEF
*	10^1	10^2	10^3	10^4	10^5	10^6	10^7	10^8	10^9	$10^{Ƨ}$	$10^{Ɛ}$

For example: *4 000 is four trin (three noughts)
*50 000 is five tet (four noughts)
*Ɛ 000 000 is elf hes (six noughts)

and $9 \times *10^8$ is nine ak (eight noughts).

To go higher than $*10^{Ɛ}$ we simply read the digits of the index in order, using NIL for nought.

$*10^{10}$ is monnil, $*\ 10^{20}$ is dynil, $*10^{36}$ is trinhes etc.

$*4{\cdot}9 \times 10^{192}$ is four point nine Mon nen dy. (NB Mr. Pendlebury uses ; for the dozenal point, and calls it "dit".)

The words can be used as suffixes in reading numbers, e.g. *265 twody sixmon five (twody is pronounced two-dye), but it is simpler to say: two six five. But *9 487 000 000 is nine four eight seven HES.

As prefixes the words derive the different orders of units. The letter -a is added for larger units, the letter -i for smaller ones. (DY becomes dyn<u>a</u> and dyn<u>i</u>; mona and moni are pronounced moan-a, moan-i).

One trinayard = $*10^3$ yards. One hesayard = $*10^6$ yards.
One moniyard = $*10^{-1}$ yard = 3 inches. One dyniyard = 3 moniinche[s]
Nine quinseviyards = $*9 \times 10^{-57}$ yards. One monirev = $\angle 30^\circ$.

Fractionals:

MONI	DYNI	TRINI	TETI	QUENI	
*0·1	0·01	0·001	0·0001	0·00001	etc.

These are best read <u>before</u> the digit names, e.g. *0·0045 is TRINI four five. <u>Trini</u> here indicates that the first significant figure stands in the third dozenal place after the point. If used after the digit names the place indicated should be that of the last digit, e.g. *0·0045 is four five TETI. Another way of reading this number is dit <u>dyni</u> four five; <u>dyni</u> now tells you the number of zeroes after the dozenal point. If *0·3 (point three, or 0;3 "dit" three) means 3 ÷ 10, then "dit dyni four" means "duni four" (0·04) divided by dozen, i.e. *0·004.

Abbreviations.

Positive and negative powers of dozen are written as superscripts and subscripts respectively before the unit named.

Monahour	${}^1hr$	(i.e. 10^1 hour)	monihour	${}_1hr$	(10^{-1}hr)
Dynahour	${}^2hr$	(10^2)	dynihour	${}_2hr$	(10^{-2}hr)

Powers of units (i.e. squares of lengths for areas, cubes for volumes) are written as superscripts after the unit named, as is current practice.

Square yard: yd^2; square quenayards $({}^5yd)^2$ $(10^5yd)^2$
square hesiyards: ${}_6yd^2$. Cubic lefayards: ${}^{\varepsilon}yd^3$.
cubic monnilyards: ${}_{10}yd^3$.

In expressions such as $x^7\ {}^5yd$ (ex to the seventh quenayards) car[e] must be taken to leave a space between the 7 and the 5. This conforms to normal practice.

How many cubic hesiyards in a cubic yard? Cubic hesiyard is written ${}_6yd^3$. Simply multiply the 6 by the 3 and the answer, as a power of dozen, is monhes, 10^{16}.

How many square yards in a square tetayard? (yd^2 / ${}^4yd^2$)? $4 \times 2 = 8$, so the answer is AK.

How many cubic yards in a cubic dyniyard? ${}_5yd^3$; ${}_2yd^3$; $(5-2)3 = 9$; answer NEN, $(*10^9)$.

How many square seviyards in a square akayard? $_7yd^2$ $^8yd^2$; (7+8)2 = 26, answer <u>dyhes</u>. (*10^{26}).

These numeric prefixes can eliminate many noughts in fractionals: *$_6$389 or C˙$_5$389 = *0˙000 003 89 (hesi three eight nine or dit queni three eight nine).

And why not write *48 000 000 000 as *48_9 instead of the longer form *48 x 10^9 ?

<u>Vulgar fractions</u>

We say 5 per cent, 6 per gross, miles per hour etc., so why not 3 per 4 for three-quarters, 2 per 3 for two-thirds? In this way dozenal vulgar fractions can be clearly expressed, e.g. $\frac{378}{9Ɛ25ᘔ}$ is three seven eight <u>per</u> nine elf two five dek. The word PER neatly separates the numerator from the denominator and avoids the confusion such as three seven eight, <u>nine-elf-two-five-dekths</u> and three seven eight nine, <u>elf-two-five-dekths</u>, i.e. $\frac{3789}{Ɛ25ᘔ}$.

So please do not speak of dyths and trinths and so on, but if you need a noun form say PERMON, PERDY, PERTRIN etc.

This system of naming numbers and units completely eliminates the problem of finding prefixes and letters that do not clash with the decimal ones: M for mega, K for kilo, c for centi etc., and all the others T for tera, G giga, H hecto: and they haven't even started yet compared with the above.

The word DO could become a general word for DOZENAL SYSTEM, e.g. *123 to be read DO one two three, ≠123 DESS one two three.

In my work at discovering a DO-metric system I have found the above methods very practical and in fact indispensable. Without them most of the time would have been consumed in concocting new words and trying to remember what they all meant. Instead all that is needed is one word per unit (say of length) and then expand it ad infinitum in both directions to tie up the atronomer to the nuclear physicist.

One or two other words are here appended as they may interest other dozenists:

TRYNIC numbers are those ending in 3, 6, 9, 0 (Trine-ick)
QUADRIC numbers are those ending 4, 8, 0.
Any trinic number multiplied by any quadric number gives a product ending in 0.
Trinic and quadric numbers are also called PRINCIPAL numbers, the rest are secondary numbers. Even powers of all ODD secondafy numbers (ending 1 5 7 Ɛ) always end in 1. All odd secondary numbers are either prime or contain factors that are themselves odd secondary.
A BY-TRINIC number (ends 6 and 0) multiplied by an even number gives a product ending in 0.
Numbers ending 2 or Ƨ are even secondaries.
Numbers like 7, 1Ɛ etc are often most easily handled as 6+1, 20-1. This principal number to which they are related is called the ANCHOR NUMBER.

ADDENDUM to the paper

As the ideas expounded in this paper are presented in the hope that dozenists may be able to put them to some use, it is hoped that many people will write and talk about them. The only copyright restriction insisted upon therefore is: That the system of naming powers of dozen (or of tens in a decimal system) and the use of those prefixes to create larger and smaller units of measure (even though the names may not be identical to those chosen by me) shall be known and referred to as the PENDLEBURY SYSTEM. Failure to use the name Pendlebury in documents or speeches publicising, explaining or commenting on the system may be deemed to be an infringement of copyright of this article. Mere usage of the system without clarification or comment is unrestricted. Authors and speakers working for profit who wish to present the system in their works should first contact the undersigned.

Signed: T.Pendlebury.

*18 August ~~1176~~. 1966
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Committee on Metrology:

a Committee is to be formed to investigate dozenal systems of metrology (see also Report of AGM). Mr. Pendlebury has been appointed Chairman of this committee, and members are invited to write to him if they are interested in helping with the work.

Your comments and criticisms (constructive, please!) of the above article, and all others in this magazine are welcomed. Please address them to the Editor.

Views expressed in articles and letters in this Newscast are those of the writers and not necessarily those of the Society.