IN QUEST OF A PANGRAM (PART 2)

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Looking back on it, I suppose the failure of the Pangram Machine Mark I was a piece of good fortune. I mean, otherwise the faster Mark II model might never have come into existence. Another advantage of the latter was that different initial text constraints could be easily entered via front panel controls, without need of rewiring. This meant I could experiment at will, confined only by the initially chosen set of number-word ranges, an important limitation, but still granting much scope.

I had a lot of fun with the Pangram Machine in the ensuing months. One early find was a sort of deadpan-gram I couldn't resist sending off to Rudy Kousbroek:

This pungram boasts four a's, two b's, one c, two d's, twenty-eight e's, seven f's, three g's, five h's, nine i's, one j, one k, one l, two m's, twenty n's, fifteen o's, two p's, one q, five r's, twenty-seven s's, twenty-one t's, three u's, six v's, ten w's, two x's, five y's and one z

A magic translation of this into Dutch has not reached me, as yet. Another example which seemed worth drawing to his attention:

This pangram containeth five a's, one b, two c's, two d's, twenty-five e's, seven f's, two g's, four h's, ten i's, one j, one k, two m's, twenty n's, sixteen o's, two p's, one q, five r's, twenty-six s's, twenty-one t's, three u's, six v's, ten w's, four x's, five y's, and one z

I don't know whether he believed my tale of it having turned up among the marginalia in a folio edition of Macbeth. Probably not. The Dutch have never entirely succeeded in throwing off the legacy of German Scepticism.

For a while I reconnoitered without any clear plan. Pangrams incorporating names of friends provided entertainment. Many new specimens were thus unearthed and the relation between initial text constants and the ranges in which solutions could be expected became clearer. After a time, the facility gained in prospecting prompted an ambitious new research program.

A shortcoming of logology, I find, is its absence of underlying structure. Like mathematics, it manifests itself in precisely defined chains of atomic symbols, yet lacks the intrinsic patterning, the symmetry of the former. Self-descriptive sentences, however, embody a strange fusion of both fields, an unlikely marriage of arbitrary convention with arithmetical necessity. A wish to extend this dualism was thus natural, and before long the idea of a

counterpart to a **number series** suggested itself: This first pan-
gram ..., This second pangram ..., This third pangram .... The
upshot can be seen in the accompanying table of 100 ordinal
pangrams, the singular legacy of a singular device. Number-words
are represented by digits. Note the use of a different verb in
each case. This is not always necessitated, since the same word
combined with different ordinals may also generate solutions. The
use of a new verb each time seemed to me demanded on esthetic
grounds.

In the meantime I made up some new plug-in matrix cards im-
plementing different number-word ranges so as to cast a wider
net able to embrace certain kinds of non-pangrams:

> This sentence employs two a's, two c's, two d's, twenty-eight e's,
> five f's, three g's, eight h's, eleven i's, three l's, two m's,
> thirteen n's, nine o's, two p's, five r's, twenty-five s's, twenty-
> three t's, six v's, ten w's, two x's, five y's, and one z

The apparent elegance of such sentences can be deceptive. Closer
scrutiny may reveal imperfections. For instance, oughtn't "one
z" to be seen as a redundant curlicue? Its inclusion is clearly
a gratuitous addition whose only apparent function is to contribute
an extra o, n and e, merely in order to make the sentence work.
Appending number-words is just a cunning form of disguised text-
doctoring. Perhaps those with a sneaking affection for the solitary
z will find consolation in:

> This sentence contains three a's, three c's, five f's, three g's,
> eight h's, thirteen i's, two l's, sixteen n's, nine o's, six r's,
> twenty-seven s's, twenty-two t's, two u's, five v's, eight w's,
> four x's, five y's, and only one z

Here the inclusion of "only" legitimizes the addition of "one z"
by "proving" it was premeditated. Even so. the choice of letter
remains arbitrary: a q would have done just as well. Purists,
however, will reject all q's, whether straight or curly, and rightly
insist on the crisp parsimony of:

> This sentence employs two a's, two c's, two d's, twenty-six e's,
> four f's, two g's, seven h's, nine i's, three l's, two m's, thirteen
> n's, ten o's, two p's, six r's, twenty-eight s's, twenty-three t's,
> two u's, five v's, eleven w's, three x's, and five y's

It is odd to realise that the existence of this minimal form seems
to vitiate the objection raised against the first version: "one z"
may be redundant, but it couldn't have been thrown in just to
make the sentence work! Such considerations should be kept in
mind when comparing different specimens.

Bimagic Pairs and Bananagrams

At a still later stage I constructed a second set of matrix cards
representing number-words in Dutch. Besides another series of
ordinal pangrams, sone of the fruits of this excursion into a new
language was:

This N[th] pangram		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1st	has	5	1	1	2	29	6	4	8	12	1	1	3	2	19	12	2	1	8	26	20	3	5	9	3	4	1
2nd	totals	5	1	2	3	29	6	4	7	10	1	1	2	2	21	16	2	1	8	28	23	4	4	9	3	5	1
3rd	contains	5	1	2	3	26	6	2	4	10	1	1	2	2	22	17	2	1	7	29	21	4	6	11	4	5	1
4th	numbers	4	2	1	2	29	7	2	6	10	1	1	1	3	23	14	2	1	9	26	20	5	5	9	3	5	1
5th	embraces	5	2	2	2	29	7	3	8	10	1	1	1	3	20	13	2	1	9	26	24	3	4	10	2	5	1
6th	harbours	5	2	1	2	28	7	4	7	10	1	1	1	2	21	15	2	1	7	28	20	4	6	9	3	5	1
7th	counts	4	1	2	2	30	5	3	7	9	1	1	1	2	23	16	2	1	7	28	21	4	7	9	2	5	1
8th	tallies	5	1	1	2	30	5	3	7	10	1	1	3	2	20	14	2	1	6	27	21	2	7	9	2	5	1
9th	exploits	4	1	1	2	28	7	4	8	13	1	1	2	2	22	16	3	1	9	26	23	5	4	9	4	5	1
10th	features	5	1	1	2	28	8	5	6	12	1	1	2	2	18	14	2	1	6	27	20	5	6	9	4	4	1
11th	utilizes	4	1	1	2	31	7	4	7	11	1	1	4	2	20	15	2	1	8	29	18	6	6	7	3	4	2
12th	tables	5	2	1	2	26	6	2	6	11	1	1	4	2	17	13	2	1	7	30	20	3	6	9	5	4	1
13th	includes	4	1	2	3	29	8	4	8	12	1	1	3	2	20	14	2	1	9	25	24	6	5	10	2	5	1
14th	recruits	4	1	2	2	28	8	4	7	10	1	1	1	2	20	15	2	1	10	26	24	6	3	9	3	5	1
15th	uses	4	1	1	2	30	7	2	5	9	1	1	1	2	22	16	2	1	5	27	21	3	7	10	2	5	1
16th	subsumes	4	2	1	2	30	7	4	8	10	1	1	1	3	21	15	2	1	8	29	21	6	4	7	3	5	1
17th	tabulates	6	2	1	2	28	7	3	5	10	1	1	2	2	20	14	2	1	6	29	24	5	6	10	4	5	1
18th	manifests	5	1	1	2	35	8	5	10	13	1	1	1	3	21	14	2	1	8	26	24	3	7	7	2	5	1
19th	assembles	5	2	1	2	35	6	5	10	12	1	1	4	3	18	12	2	1	8	28	23	3	7	9	2	4	1
20th	summons	4	1	1	2	29	7	3	5	11	1	1	2	4	22	16	2	1	6	28	21	5	6	10	4	5	1
21st	shows	4	1	1	2	29	6	3	6	11	1	1	3	2	22	16	2	1	8	29	21	4	4	11	5	6	1
22nd	displays	5	1	2	4	33	5	3	9	12	1	1	3	2	21	13	3	1	9	28	25	2	6	10	2	7	1
23rd	produces	4	1	2	4	26	6	2	4	10	1	1	2	2	22	17	3	1	9	29	21	6	4	11	5	6	1
24th	evinces	4	1	2	2	26	6	2	4	9	1	1	2	2	21	17	2	1	7	30	20	5	7	11	4	6	1
25th	discloses	4	1	2	3	32	7	3	9	11	1	1	3	2	20	14	2	1	9	28	25	3	5	10	2	6	1
26th	sustains	5	1	1	2	32	5	2	7	10	1	1	1	2	23	14	2	1	7	29	25	3	7	10	3	6	1
27th	heralds	5	1	1	3	34	5	3	10	8	1	1	3	2	20	12	2	1	10	27	24	3	7	9	2	6	1
28th	presents	4	1	1	2	35	5	3	9	11	1	1	2	2	23	13	3	1	9	27	25	2	7	10	2	6	1
29th	embodies	4	2	1	3	38	5	4	11	11	1	1	3	3	21	13	2	1	10	27	25	3	7	8	2	6	1
30th	claims	5	1	2	2	29	9	2	7	13	1	1	2	3	23	15	2	1	9	24	24	4	5	10	1	5	1
31st	holds	4	1	1	3	29	7	3	8	10	1	1	2	2	22	15	2	1	9	27	25	3	4	10	2	6	1
32nd	furnishes	4	1	2	3	26	7	4	8	12	1	1	2	2	19	16	2	1	10	30	21	6	4	8	4	5	1
33rd	indexes	4	1	1	4	27	9	3	6	14	1	1	1	2	22	15	2	1	9	26	20	5	4	8	5	6	1
34th	reveals	5	1	1	2	25	9	2	6	13	1	1	2	2	20	15	2	1	9	26	23	4	5	10	4	6	1
35th	lists	4	1	1	2	29	9	3	7	11	1	1	3	2	22	15	2	1	8	27	24	4	5	10	2	6	1
36th	tenders	4	1	1	3	29	8	4	8	12	1	1	2	2	20	14	2	1	10	25	24	5	5	9	3	6	1
37th	signals	5	1	1	2	25	8	4	5	14	1	1	2	2	21	16	2	1	6	29	22	4	6	10	5	6	1
38th	yields	4	1	1	3	30	7	4	9	12	1	1	3	2	21	15	2	1	9	26	21	4	5	8	2	7	1
39th	advances	6	1	2	3	27	5	4	9	13	1	1	2	2	20	12	2	1	8	28	25	3	6	10	4	6	1
40th	inventories	4	1	1	2	31	6	4	8	11	1	1	2	2	20	17	2	1	10	27	23	4	6	8	3	5	1
41st	consumes	4	1	2	2	26	8	3	5	11	1	1	2	3	20	16	2	1	9	29	22	5	4	10	4	6	1
42nd	marshals	6	1	2	3	25	6	2	7	10	1	1	2	3	20	15	2	1	9	30	21	2	3	9	4	6	1
43rd	gathers	5	1	1	3	28	9	5	8	11	1	1	2	2	20	15	2	1	10	24	23	4	4	9	2	6	1
44th	registers	4	1	1	2	30	7	5	7	11	1	1	2	2	19	16	2	1	10	28	22	4	6	8	3	5	1
45th	items	4	1	1	2	30	7	3	8	9	1	1	1	3	21	16	2	1	10	27	22	4	4	7	3	6	1
46th	combines	4	2	2	2	28	6	3	7	11	1	1	2	3	21	17	2	1	9	30	21	4	5	9	4	6	1
47th	bequeaths	5	2	1	2	26	7	2	5	10	1	1	1	2	19	16	2	2	6	30	22	4	7	10	4	5	1
48th	boasts	5	2	1	2	27	7	3	6	10	1	1	1	2	20	15	2	1	6	29	23	2	5	10	4	6	1
49th	blends	4	2	1	3	32	8	5	11	13	1	1	3	2	18	14	2	1	10	25	25	3	6	8	2	5	1
50th	enumerates	5	1	1	2	36	7	3	8	11	1	1	2	3	22	14	2	1	9	27	23	4	7	9	2	5	1

This N[th] pangram	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
51st deploys	4	1	1	3	30	8	4	7	10	1	1	2	2	21	16	3	1	9	28	21	4	5	7	2	7	1
52nd exhibite	4	2	2	3	29	8	3	7	13	1	1	2	2	22	16	2	1	9	29	24	5	4	11	4	6	1
53rd demands	5	1	1	5	29	7	3	6	14	1	1	2	3	21	12	2	1	6	28	20	2	6	9	5	6	1
54th musters	4	1	1	2	27	8	4	6	12	1	1	2	3	21	16	2	1	8	29	21	6	4	9	5	6	1
55th inherits	4	1	1	2	29	10	2	7	11	1	1	2	2	23	15	2	1	9	26	24	4	3	10	3	6	1
56th implements	4	1	1	2	31	9	3	8	12	1	1	3	4	20	14	3	1	10	27	21	5	5	6	4	6	1
57th concatenates	6	1	3	2	30	6	3	9	12	1	1	3	2	20	12	2	1	9	28	24	3	5	9	4	6	1
58th incurs	4	1	2	2	27	9	4	8	13	1	1	1	2	22	15	2	1	9	26	24	5	3	10	3	6	1
59th betokens	4	2	1	2	32	7	3	8	11	1	2	3	2	21	15	2	1	7	29	25	2	6	11	3	6	1
60th appoints	5	1	1	2	29	7	3	5	12	1	1	2	2	21	16	4	1	6	28	22	4	7	10	4	5	1
61et enlists	4	1	1	2	27	8	3	6	13	1	1	2	2	22	15	2	1	9	29	25	4	3	10	4	6	1
62nd delivers	4	1	2	4	26	7	2	4	13	1	1	2	2	22	17	2	1	9	30	19	5	6	9	4	5	1
63rd conflates	5	1	2	3	32	8	5	10	14	1	1	2	2	18	14	2	1	9	27	25	3	6	8	3	5	1
64th annexes	5	1	1	2	30	9	3	8	13	1	1	1	2	23	15	2	1	9	25	21	4	5	7	4	6	1
65th entails	5	1	1	2	30	7	3	7	11	1	1	3	2	21	14	2	1	8	29	20	4	6	7	4	6	1
66th enrols	4	1	1	2	26	4	3	7	10	1	1	2	2	21	17	2	1	9	30	21	4	3	8	6	6	1
67th harvests	5	1	1	2	30	5	3	9	12	1	1	2	2	21	14	2	1	9	28	23	3	6	9	4	6	1
68th proffers	4	1	1	2	29	8	5	8	14	1	1	1	2	22	16	3	1	9	26	22	4	3	9	5	6	1
69th cultivates	5	1	2	2	26	8	3	5	14	1	1	2	2	20	14	2	1	6	29	24	5	7	10	5	6	1
70th requires	4	1	1	2	37	5	3	9	11	1	1	3	2	20	12	2	2	10	25	23	3	8	9	1	5	1
71st divulges	4	1	1	3	29	9	5	6	14	1	1	2	2	23	15	2	1	9	28	21	6	4	8	4	6	1
72nd amalgamates	8	1	2	3	35	5	4	9	10	1	1	3	4	21	12	2	1	10	29	23	3	6	7	3	6	1
73rd discerns	4	1	2	4	25	7	2	4	10	1	1	1	2	23	16	2	1	10	29	20	6	4	9	4	6	1
74th announces	5	1	2	2	32	6	3	8	10	1	1	2	2	22	15	2	1	7	29	25	3	7	11	3	6	1
75th presages	5	1	1	2	37	6	7	11	13	1	1	3	2	19	12	3	1	8	28	24	2	8	8	2	5	1
76th appropriates	6	1	1	2	28	8	4	5	12	1	1	2	2	20	15	5	1	7	29	22	4	7	10	4	6	1
77th unites	4	1	1	2	33	6	6	10	12	1	1	2	2	18	14	2	1	8	28	24	5	7	8	3	5	1
78th nominates	5	1	1	2	39	5	4	11	11	1	1	3	3	23	13	2	1	10	27	24	3	8	7	2	6	1
79th needs	4	1	1	3	36	5	6	11	12	1	1	4	2	18	12	2	1	8	27	22	3	8	8	3	5	1
80th wins	4	1	1	2	30	6	3	9	11	1	1	2	2	21	15	2	1	9	24	23	3	3	10	2	5	1
81st acquires	5	1	2	2	29	9	4	6	14	1	1	2	2	21	15	2	2	9	28	23	5	4	11	3	6	1
82nd exposes	4	1	2	3	34	8	6	10	12	1	1	2	2	18	15	3	1	9	28	21	4	5	7	3	5	1
83rd requisitions	4	1	1	3	28	7	4	7	12	1	1	2	2	20	15	2	1	10	29	24	6	4	10	3	6	1
84th enjoys	4	1	1	2	30	7	6	10	11	2	1	2	2	17	15	2	1	8	28	23	4	5	8	3	6	1
85th gains	5	1	1	2	27	9	4	6	13	1	1	1	2	22	15	2	1	6	27	22	3	5	10	4	6	1
86th procures	4	1	2	2	30	6	3	7	11	1	1	2	2	20	14	3	1	10	29	19	5	6	7	4	5	1
87th pools	4	1	1	2	33	8	4	10	11	1	1	3	2	19	15	3	1	10	26	22	4	5	6	3	5	1
88th recsives	4	1	2	2	31	7	5	9	14	1	1	1	2	20	15	2	1	8	26	22	3	5	9	3	6	1
89th inscribes	4	2	2	2	27	8	6	8	14	1	1	2	2	20	15	2	1	8	29	24	5	4	11	3	6	1
90th allocates	6	1	2	2	26	7	2	5	12	1	1	4	2	17	15	2	1	6	30	22	3	6	10	5	4	1
91st publishes	4	2	1	2	27	6	2	7	10	1	1	2	2	20	14	3	1	10	30	23	5	4	9	3	6	1
92nd signifies	4	1	2	3	26	7	3	6	12	1	1	2	2	20	15	2	1	9	30	22	4	3	10	4	6	1
93rd delineates	5	1	1	4	36	5	3	9	12	1	1	4	2	21	12	2	1	10	27	23	3	7	8	3	6	1
94th identifies	4	1	1	3	32	7	4	7	11	1	1	2	2	22	17	2	1	8	28	24	5	7	10	2	6	1
95th joins	4	1	1	2	29	7	2	5	11	2	1	3	2	23	16	2	1	7	29	22	4	6	12	4	6	1
96th adopts	5	1	1	3	34	5	3	10	12	1	1	2	2	21	13	3	1	9	27	25	2	7	8	3	5	1
97th gets	4	1	1	2	31	7	5	9	13	1	1	1	2	22	15	2	1	8	26	24	3	5	8	3	6	1
98th providee	4	1	1	3	33	5	3	10	12	1	1	2	2	20	13	3	1	10	25	25	2	7	9	2	6	1
99th cataloguea	6	1	2	2	27	8	4	6	13	1	1	2	2	23	15	2	1	7	29	24	5	5	10	4	6	1
100th describes	4	2	2	5	28	9	4	8	13	1	1	1	2	21	15	2	1	9	26	23	5	4	10	2	5	1

> Dit pangram bevat maar negen a's, twee b's, vier c's, vier d's,
> drieënveertig e's, twee f's, zeven g's, vier h's, vijftien i's,
> twee j's, een k, een l, drie m's, twintig n's, een o, twee p's,
> een q, negen r's, twintig s's, achttien t's, een u, acht v's, acht
> w's, een x, een y, en twee z's

That is, "This pangram contains but nine a's, two b's, .., etc.,
one y, and two z's." This may seem unremarkable but being in
Double-Dutch we still have the second half to come:

> Maar dit pangram bevat acht a's, twee b's, drie c's, vijf d's, een-
> enveertig e's, vijf f's, zes g's, drie h's, zeventien i's, vijf
> j's, een k, een l, drie m's twintig n's, een o, twee p's, een q,
> acht r's, tweeëntwintig s's, vijftien t's, een u, negen v's, zes
> w's, een x, een y, en vier z's

That is, "But this pangram contains eight a's, two b's, .., etc.,
one y, and four z's." The peculiar thing here is that although
differing in the number-words they use, the two pangrams exhibit
(essentially) identical texts. Or, to put it the other way around:
although the words used are the same, the pangrams list different
numbers of letters! Certain minds seem to balk at this confronta-
tion with a single text composed of nine a's this time and eight
the next. I have even known the delight of hearing someone pat-
iently explain to me that such a thing can only be a logical im-
possibility!

Logic, however, should never be confused with logologic. The
sentences above are of course no more than a single text to which
two solutions have been found. The possibility of such **bimagic**
cases had been in my head from the start. Though at first sight
twisty, the cunning interlock between bimagic pairs is neatly brought
out through considering the following two lists:

ten i's	eleven i's
one l	two l's
eighteen t's	nineteen t's
seven w's	eight w's

The four numbers on the right are all one greater than those on
the left, a difference on the descriptive level of one i, one l,
one t, and one **w**. But cancelling common letters in the two lists
will leave precisely that: the text on the right contains an extra
i,l,t and **w**. Denotational differences parallel those at the typo-
graphical level. A self-descriptor incorporating one of these lists
remains a self-descriptor if that list is replaced by the other.
A similar but more complicated pair of lists can be extracted from
any bimagic solution.

Notice that despite suggestive associations, a pair of sublists
so derived can never comprise true anagrams of each other. For
if their letter content agreed then the numbers named would have
to be the same, which would imply identity. Taking into account
their slippery character and the ban on anagrams, l propose a
special name for these curiosities: **bananagrams**. Beside their oc-
currence in bimagic self-descriptors, a search for bananagrams
could easily form a study in its own right.

How rare are bimagic cases? Of the roughly one in eight initial texts to yield a simple self-descriptor, again something like one in eight of these turn out to have dual solutions. Is this coincidence, or might a theory be developed for predicting it? Trimagic cases are naturally even rarer. Several hundred runs with the machine have located only one, its unpleasing text being "This twenty-first pangram scored...". A finer example of the polymagic genre is seen in a near translation of the Dutch pair above. Here, the false modesty of the first is countered by the second one turning the tables:

This pangram tables but five a's, three b's, one c, two d's, twenty-eight e's, six f's, four g's, six h's, ten i's, one j, one k, three l's, two m's, seventeen n's, twelve o's, two p's, one q, seven r's, twenty-nine s's, twenty t's, five u's, six v's, eight w's, four x's, four y's, and one z

But this pangram tables five a's, three b's, one c, two d's, twenty-nine e's, six f's, six g's, eight h's, eleven i's, one j, one k, three l's, two m's, seventeen n's, fourteen o's, two p's, one q, eight r's, twenty-eight s's, twenty-two t's, six u's, four v's, eight w's, four x's, four y's, and one z

So much then for the products of the Pangram Machine. Far from everything has found room for inclusion here, the charm of such curiosities being limited, with one self-descriptor soon seeming much like another. But one sting in the tail deserves another. Kousbroek's challenge was to produce a magic translation of his pangram. Having offered one, I should like to present another. It is the second half of what he had never imagined, a bimagic translation. The first is repeated alongside:

This pangram contains four a's, one b, two c's, one d, twenty-six e's, six f's, three g's, six h's, eleven i's, one j, one k, two l's, two m's, seventeen n's, fifteen o's, two p's, one q, eight r's, thirty s's, seventeen t's, four u's, four v's, six w's, six x's, three y's, & one z

This pangram contains four a's, one b, two c's, one d, thirty e's, six f's, five g's, seven h's, eleven i's, one j, one k, two l's, two m's, eighteen n's, fifteen o's, two p's, one q, five r's, twenty-seven s's, eighteen t's, two u's, seven v's, eight w's, two x's, three y's, & one z

An act of magic consists in doing what others believe impossible. The magic of self-descriptive sentences lies in the unbelievable coincidence they effect between a message and its medium. This is a good example of what Freud would have called an over-determined structure: over-determined because it simultaneously satisfies independent sets of demands. Of course, a discipline devoted to over-determined texts already exists: a technical field in which distillation of meaning and coalescence of form with content have ever been focal concepts. Its name is poetry. Let none suppose that anything but poetry has been our purpose here.