A NOTE ON CATOPTRONS

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The suggestion that Palindromes may be enriched must be a traumatic statement to practitioners of that artful craft, so we will just say that possibly its image may be changed. We ourselves have labored at the making of Palindromes (often to bring forth a mouse) and are aware of the beauty and difficulty of them. We are not damming with faint praise.

A Palindrome reverses letter-order or word-order, but not the letters themselves. Letter-reflection, and the sentences that can result, presents a large, little-exploited field of recreational word-play. For this recreation we propose the word CATOPTRONICS; actual examples may then be called CATOPTRONS. Both terms are based on a Greek word for mirror.

For our purposes we divide Catoptrons into three categories: horizontal reflections, or H; vertical reflections, or V; and a combination of the two reflections, or HV. The H, V and HV refer to the direction of the line (or lines) across which a letter is reflected; these lines are shown dashed in the examples below. For instance, the letter B can be reflected horizontally without change:

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B
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The letter A reflects vertically into itself:

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/\  
/  \ 
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The letter Z can be reflected twice, HV, to give us back its original form. This double reflection is equivalent to rotating the letter around its center $180^\circ$ in its plane:

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Z  \ /
/   \ 
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Of course, there are more letters in each category with these potentialities. The reader may easily discover them for himself.

In passing, we note that nomenclature seems far from stabilized in this field. For instance a Mennonite and a Mennonite Curiosity all three might claim is admissible and even desirable.

But perhaps this is because the field is so new, and there may be many more possibilities still hidden in the letters.

One could take the letters B, E, and H as examples, but if written in electronic form, they are perhaps too well known to be interesting. But perhaps some other letterers could take the initiative and test some other letters.

For instance, we note that nomenclature seems far from stabilized in this field, and perhaps some other letters could take the
in this field. On pages 27-8 of Language on Vacation, Dmitri Borgmann calls the HV reflection a Vertical Palindrome, the V reflection a Mirror Palindrome (Type A), and the H reflection a Mirror Palindrome (Type B). On pages 345-6 of Bombaugh’s Oddities and Curiosities of Words and Literature, Martin Gardner recognizes all three Catoptron categories, but gives them no names. Charles Trigg has used the word Strobogrammatic to describe the HV reflection applied to numbers instead of letters.

The typewriter yields only a few exact mirror-images. Capital E reflects horizontally; capital A reflects vertically, as does Y. But capital M reflects horizontally to capital W, and lower-case b becomes d in V and p in H.

One finds rather scant pickings when he explores the catoptronic possibilities of the typewriter. Frankly, we would eliminate it in favor of longhand -- if we break with the tyranny of the machine and take certain liberties, we can enlarge the stockpile of usable letters and words, and generally have more fun. Too, there is an aesthetic pleasure to be derived from the use of pen or pencil which the machine does not give -- and one does not have to be a professional letterer, either, to obtain rewarding results. The only thing we need ask ourselves is, Are our compositions in longhand easily readable? If not, the liberties taken are not justified.

For reasons that will become clear, we suggest the following letters be done in longhand. Write a as , which reflects in HV as . We think is legible -- and is a very useful letter to have on hand, with its high frequency occurrence! is the same in HV; if written N it becomes N in V, and N in H. Another useful letter is added by this small liberty. T, if written , is reflectable in all three categories; as T it is only usable in the V category. E, written , may be used in V reflections, as can Y for R. Readers may discover other letter-adaptations which will enlarge the catoptronic stockpile. One’s conscience, or communication-sense, will test their validity.

We are composing, for instance, a vertically-reflected sentence, and need a B. B does not properly reflect vertically into itself. But if written as b, which reflects vertically as d, we will perhaps succeed in our effort. And we do believe that upper and lower case may be combined in Catoptronics: legibility is the only criterion.

A few words and sentences from the three categories of V, H and HV are presented below. They are printed in longhand and take the liberties spoken of above.
VERTICAL  This is the letter-ordering of the Palindrome, and there are a number of letters which reflect vertically. Individual words which fulfill catoptronic requirements are not too difficult to find:

brow | word  told | bio+
pig | pig

However, sentences are harder to discover:

you'd level buoy
yard a drapery
animal no beggar tappled on lamina
live on time | xmit | no evil

and we must not forget the well-known palindrome and catoptron TOO HOT TO HOOT. This is one of the few examples of Catoptrons obtainable on the typewriter alone; OHM, which reflects HV to WHO, is another.

HORIZONTAL  Using the longhand N and the + for T, many sentences present themselves in this category:

HEXED COOK HID IN ICEBOX
HEXED COOK HID DICED CHICKEN +IDBI+ IN ICEBOX
INHIBITED HE EXHIBITED IONIC CODEX IN _ HIDDEN NOOK - COOKBOOK I THINK

and that is quite enough of that cook, with his troubles! On other subjects, we may make:

EXCI+ED BEE BI+ BE+B ON NECK

and

+OKIO CHICK IN OBI - NICE (C18-1133)

with its questionable overtones.
HORIZONTAL-VERTICAL  To test the validity of the following,
turn the magazine upside-down:

pedig big biped
NOW No sex at;te xes ON MON
pie ON SNOODS; SPOONS NO eID

and

¡ole! ¡ole!

which is Spanish for Long Live Garlic.

If one should wish to explore the field further, and knows some­
thing of the Greek alphabet, one may come up with sentences like:

φαιον ευχαριστει

which, translated, means Faith Says She's Thief. (But, knowing
her, we don't believe it.)

Finally, sentences can be written vertically instead of horizon­
tally, and then subjected to a V reflection or a H reflection. We
give two examples, the left-hand one vertically reflected and the
right-hand one horizontally reflected:
The reader who has gone along with us this far is now in a position to consider the truth or falsity of the following mathematical statements:

\[ 9 + 9 < 18 \]
\[ 88 - 66 = 11 \]
\[ 0 > \infty \]

I hope that you will have pleasure reflecting on my reflections about reflections, and that you will agree that they do change the image of the Palindrome. It is hoped that you will attempt the composition of Catoptrons in all three categories. The field has not been deeply explored, we think, and there is room for everyone.

**QUERY**

Can the readers of Word Ways find a word (or name) of \( n \) letters long and ending with the \( n \)th letter of the alphabet, varying \( n \) from 1 to 26? The best results of Darryl Francis are given below; the only missing words are those ending in V, W, X and Z. Unasterisked words come from Webster's Unabridged, and asterisked words from references such as Dorland's Medical Dictionary and the Times Index-Gazetteer.


Similarly, can one find a word (or name) of \( n \) letters ending with the \( (27 - n) \)th letter of the alphabet?

*hemangioendothelioblastoma, ---, *methylene-citrilysalicylic, ---, isonicotinoylhydrazine, ---, slaughter-threatening, ballistocardiograph, labyrinthbranchial, *Ancoquishachayoj, undersheriffwick, noninstrumental, libertarianism, vaccination, whillaballoo, thunderclap, qaraqalpaq, godmother, slowness, content, bureau, sclav, slow, box, my, z

**CAN YOU SOLVE THIS?**

This column, which can match the lines below, can be completed: 8, 8, 8, 8.

**LOGOMACHINE**

The best score so far was 87 points, the line below that its equal. P. F. Cal. came up with "I'd rather not play this time with an 87", and wrote double and triple.

Besides (or with?) TA and COST, you can get 88, obtained by playing the words GO, WOB along with the word PUPI. The actual reaction is obtained by playing the word HEMANGIOENDOTHELIOMASTOMA, to get WOB + GO + HEMANGIOENDOTHELIOMASTOMA = 88 points. After a slight possible change, this is the best possible score.

The word LOGOMACHINE is actually 88 points, constructed from the words LOG, O, M, A, H, I, N, C, E, A.

Josefa B. used "WOB". Using any score of 88 himself, he wrote that he can be achieved.

T is above the...