

ARTS3755

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7 fYX]hDc]bhg**

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#b 'th]g 'Wci fgYz'mci 'k]```XfUk 'i dcb 'th Y _bck `YX[Y 'UbX 'g_]``g 'Zfca 'dfYj]ci g 'Wci fgYg 'tc 'XYg][b 'U \i a Ub]tUf]Ub 'cf 'XYj Y`cda Ybh'dfc YWf'; fci d 'k cf_'k]```VY 'VUgYX 'cb ']btYfX]gW]d`]bUfm'Wc```UVcfUt]cbg 'tc Uff]j Y 'Uh'WfYUt]j Y 'Yj]XYbWY!VUgYX 'gc`i t]cbg 'tc 'XYj Y`cda Ybh'Wk U``Yb[Yg"' Mci 'k]```YI dYf]YbW' 'k cf_]b[']b 'U a i `t]!YI dYfh'hYUa z'UbX '`YUfb 'th Y 'VUg]Wg 'cZdfc YWhXYg][b ']b 'XYj Y`cda Ybh'UbX`\i a Ub]tUf]Ub 'Ugg]gtUbW'' Mci 'k]```U`gc '\Uj Y 'th Y 'cddcfhi b]m'tc Yb\UbW' mci f'i bXYfgtUbX]b['cZU'fY[]cb 'cf'Wci bHfmcZmci f'Wkc]W'' 8Y`]j YfYX ']b 'U'gYa]bUf'a cXY 'k]th 'cddcfhi b]tjYg 'Zcf']bXYdYbXYbhghi Xmz'th]g 'Wci fgY ']g 'XYg][bYX 'tc 'dfYdUfY ghi XYbhg 'Zcf'k cf_']b 'th Y 'XYj Y`cda Ybh'cf'\i a Ub]tUf]Ub 'gYWfcf''

7 ci fgY @YUfb]b[Ci hWca Yg

% 5dd`mih\Y`Z bXUa YbhU`g`cZYj]XYbWY!VUgYX`UbX`WcbhYl hgdYWJZ]Wdfc`YVhiXYg][b" &" 5dd`mih\Y`a cghiUddfcdf]UhY`XYj Y`cda YbhiUddfcUW\Yg`Zcf`VYghdfUWJWY`dfc`YVhiXYg][b " " 8Yj Y`cd`Ub`]bbcj Uh]j Y`gc`i h]cb`hc`U`dfYgg]b[`[`cVU``XYj Y`cda YbhW\U``Yb[Y"

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K \Yb'mci 'gi Va]hUb'UggYgga Ybh'Uhi BGK žmci 'UfY'UW_bck 'YX[]b['h\Uhmci '\Uj Y'i bXYfghccX'UbX UV]XYX'Vmh\Y'l b]j Yfg]hmfYei]fYa Ybhg']b'h\Y'dfYdUfUh]cb'cZh\UhiUggYgga Ybh]hYa ž']b'fYgdYWhcZghi XYbh UWUXYa]Wa]gWcbXi Whici h]bYX']b'h\Y'Ghi XYbh7cXY'Dc']WmUbX'Ghi XYbhA]gWcbXi Wh'DfcWYXi fYgžVch\'cZk\]W\'UfY'Uj U]'UV'Y'Uh\hhdg.#ghi XYbh'i bgk "YXi "Ui #\bcbXi Wh'Mci 'UfY'U`gc'XYWUf]b['h\Uhh\Y'UggYgga Ybh]hYa ']g'mci f'ck b'k cf_žYI WYdhk\YfY'U\W_bck `YX[YXž'UbX'\Ug'bchVYYb'gi Va]hhYX'Zcf'UWUXYa]\WWfYX]h dfYj]ci g`m]b'k \c`Y'cf']b'dUfh'

#D UXX]h]cbžmci gi Va]hh\Y UggYgga Ybh]b h\Y _bck `YX[Y h\Uh

- %" h\Y`Wci fgY`Wcbj Ybcf`a Umdfcj]XY`U`WcdmcZh\Y`Ugg][ba Ybhhc`Ubch\Yf`ghUZZcf`h\Y`di fdcgYg cZUggYgga Ybhcf`Yj U`i Uhjcb/UbX`
- &" U'WcdmcZh\]g'UggYgga Ybh']hYa 'k]```VY'fYhJ]bYX']b'h\Y'Hi fb]h]b'XUhUVUgY'UbX'a UmVY'i gYX |b'Yj U'i Uh|cbg'cZcf][|bU`]hm'

I BGK 'dfcj]XYg'gi ddcffrZcf'gh XYbhg']b'i g]b['Hi fb]h]b'Uh\hdg.#gh XYbh'i bgk "YXi "Ui #i fb]h]b! gi ddcfh''.'H\]g'k YVdU[Y']bW XYg']bZcfa Uh]cb'cb'\ck 'hc'[YbYfUhY 'UbX']bhYfdfYhcf][]bU`]hmfYdcfhg']b Hi fb \hd \hd (fh')g'U`gc'Uj U]`UV`Y'Zfca 'h\Y'W\bhYf'' hi fb]h]b'< Y`d'7 YbhYf'Uh \hd.#hi fb]h]b''Wca #\bSi g#qi ddcfh*\Y'd!W\bhYf''

D`YUgY'bchY'l BGK ž: UW'\miUbX'GW\cc\'dfchcWc\g'fY[UfX]b['gdYW]U\

Webg]XYfUh]cbg`f\khdg.##gh`XYbh'i bgk "YXi "Ui #gdY\W]U`!\Webg]XYfUh]cb\L/`\Uh\' gi Va]gg]cbg`UbX`fYj]Yk `cZ fYgi `hg

 $fh h dg. \#k \ k \ "Ufhg" i \ bgk "YXi "Ui \ \#W ffYbh! ghi \ XYbhg \#UWUXYa \]W]b Zcfa \ Uh]cb \#D fchc Wc`g!; i \]XY`]b Yg \#" 8 c a U_Y mci fgY`ZZUa]`]Uf`k]h\ 'h\ Yg Y"$

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5ggYgga Ybh'hJg_	K Y][\h	8i Y [.] 8UhY	Gh XYbh@YUfb]b[Ci hWca Yg 5ggYggYX
7 f]h]WU``5ddfU]gU``cZDfcYWh 8 Yg][b`A Yh\cX') \$1	\$&#\$+#&\$&%`%%\$\$`DA</td><td>%ž &</td></tr><tr><td>Dfc YWi8Yg][b</td><td>) \$1</td><td>\$- #\$, #&\$&%`%%\$\$`DA</td><td>%ž''</td></tr></tbody></table>	

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GhUfhXUhY. Bch5dd`]WUV`Y

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8YHJ]`q.

@Yb[h\. %\\ \$\$\$ hc \(\% \) \$\$ k cfXg

8 YgWf]dh]cb.]b 'h,]g 'k f]hhYb 'UggYgga Ybhz'mci 'k]```gY`YWhU 'hmdY cZXYj Y`cda Ybhdfc YWha Yh, cX`ffcf Yl Ua d`Yž'h, Y``c[]\WJ``ZfUa Yk cf_ 'UddfcUW, /h, YcfmcZW, Ub[Y/\Wf]h]\WJ``dUh, 'UbU`mg]g/\Wca dcbYbh\VUgYX XYg][b/[YbXYf'a U]\bghYUa]\b[\z\z'\f]YZm]\bhfcXi \W' 'h, Y`a Yh, cXz'UbX'dfcj]XY`U'hUf[YhYXz'\Wf]h]\WJ``UddfU]gU` UVci hcbY`_YmghfYb[h, 'UbX'cbY`_Ymk YU_bYgg`cZh, Y`UddfcU\W,

Mci 'k]```fYWY]j Y`k f]hhYb`ZYYXVUW_``UbX`U`bi a Yf]WU``[fUXY`k]h\]b`hk c`k YY_g`cZgi Va]gg]cb`h\fci [\ 'h\Y I b]j Yfg]lmfg`@YUfb]b['A UbU[Ya YbhGmghYa 'f@A GŁ"'H\Y`ZYYXVUW_`g\YYh#fi Vf]Wk]```VY`Uj U]`UV`Y`hc`mci 'Uh h\Y`ghUfhcZh\Y`Wci fgY`gc`h\Uhih\YmWUb`k cf_`hck UfXg`gdYWZ]YX`ghUbXUfXg"

5XX]h]cbU`XYhU]`g.

D`YUqY`qYY`A ccX`Y`Zcf`a cfY`]bZcfa Uhlcb"

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 $\label{thm:continuous} \begin{tabular}{ll} Hi & fb & fb & gYM &$

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GhUfhXUhY. Bch5dd`lWUV`Y

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8 YgWf]dh]cb. 'mci 'k]``'WfYUhY 'U'XYj Y`cda Ybhidfc YWhidfcdcgU`'''Mci 'a i ghi]bWi XY'h\Y'Zc``ck]b['Wca dcbYbhg. 6UW_[fci bX#Uh]cbU`Y'Zcf'h\Y'XYj Y`cda Ybhidfc YWh'dfc YWh'[cU`g'UbX'ci hWca Yg/h\Y'UWhj]h]Yg'cZh\Y dfc YWh'UbX'k \mih\YmUfY'bYWh'ggUfmz'h\Y'dfc YWhg'hUf[YhYX'VYbYZ]WJUf]Yg'UbX'k \m'dfc YWhija YZhUa Y'UbX Yghja UhYX'Vi X[Yh''5 fUb[Y'cZhYa d`UhYg'UbX'dfc YWhXYg][b'dfcdcgU`g'k]```VY'a UXY'Uj U]`UV`Y'Zcf']XYUgž Vi hmci 'k]``VY'Yl dYWhYX'hc'i bXYfhU_Y']bXYdYbXYbhifYgYUfW\'Ug'k Y``hc'XYj Y`cd'UbX'XYg][b'h\Y]f'dfc YWh'

Mci 'k]```fYWY]j Y`k f]hhYb`ZYYXVUW_``UbX``U`bi a Yf]WU``[fUXY`k]h\]b`hk c`k YY_g`cZgi Va]gg]cb`h\fci [\ 'h\Y I b]j Yfg]lmfg`@YUfb]b['A UbU[Ya YbhGmghYa `f@A GŁ"`H\Y`ZYYXVUW_`g\YYh#fi Vf]Wk]```VY`Uj U]`UV`Y`hc`mci `Uh h\Y`ghUfhcZh\Y`Wci fgY`gc`h\Uhih\YmWUb`k cf_`hck UfXg`gdYW]ZYX`ghUbXUfXg""

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Gi Va]gg]cb bchYg. Cb`]bY gi Va]gg]cb

Hi fb]hb gYhb[. H\]g]g bchU Hi fb]hb Ugg][ba Ybh

FYgci fWyg

DfYgWf]VYX F Ygci fWYg

5```h\Y`Wci fgY`fYUX]b[gž'UggYgga Ybhg`]bZcfa Uh]cbž'a Uf_]b[`fi Vf]WUbX`ch\Yf'dfYgWf]VYX`fYgci fW'g`k]``VYUj U]`UV`Y`Zcf`Xck b`cUX#]Yk]b[`cb`h\Y`A ccX`Y`dU[Y"

FYWca a YbXYX FYgci fW/g

D'YUgY Wcbgi 'hA ccX'Y

7ci fgY 9j U`i Uh]cb UbX 8Yj Y`cda Ybh

Ghi XYbhZYXVUW_cZYj U`i Uhjcb']g`Wfi WjU`hc`XYj Y`cd'UbX`]a dfcj Y`h\]g`Wci fgY`Z fh\Yf']b`gi VgYei YbhmYUfg" A m'9I dYf]YbWY`gi fj Ymk]```VY`WcbXi WhX`hck UfXg`h\Y`YbX`cZh\Y`hYfa "`'5hK YY_'' ž'h\YfY`k]```VY`U``'Wci fgY\\YU`h\`W\Y\W_``k]h\`h\Y`WUgg"'H\]g`k]```VY`Ub`cddcfhi b]mmZcf`ghi XYbhg`hc`dfcj]XY`ZYYXVU_UbX gi [[Ygh]cbg`cb``YWfi fYž'WcbhYbhz`fYUX]b[gžhi hcf]U``UWfjj]h]Yg`UbX`ch\Yf`h\]b[g`k\]W\`k]```Yb\UbWY``YUfb]b[YI dYf]YbWY''`

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

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Image: Ybwei bhyfu'dfcv'ya k \yb'uhhya dhjb['hc'gi va]hmci f'Ugg][ba Ybhh\fci [\ 'Hi fb]h]bž'd'YUgY

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\ci fg'UfY', .\$\$Ua '-'%\$.\$\$da 'cb'k YY_XUmg'UbX'-.\$\$Ua '-').\$\$da 'cb'k YY_YbXg'fl *) 'XUmg'U'mYUft"'=Z'mci
UfY'i bUV'Y'hc'gi va]hmci f'Ugg][ba YbhXi Y'hc'U'ZJi 'hk]h\ 'Hi fb]h]b'mci 'a UmUdd'mZcf'Ub'Y! hy'bg]cbž'Vi hmci
a i ghfYhJ]b'mci f'h]W_Yhbi a VYf'Zfca '9! hy'fbU''Gi ddcfhfU'cb['k]h\ 'Ubmch\Yf'fy'Yj UbhXcW a Ybhgt'hc
]bWi XY'Ug'Yj]XYbW' hc'gi ddcfhmci f'Y! hy'bg]cb'Udd']WUh]cb"'=Zmci 'Ya U]''9! hy'fbU''Gi ddcfhmci 'k]'`
Ui hca Uh]WJ'`mfYW']j Y'U'h]W_Yhbi a VYfZ'Vi h]Zmci 'hy'Yd\cby'mci 'k]``bYYX'hc'gdYW]Z]WJ'`mUg_'Zcf'cby''
Hi fb]h]b'U'gc'dfcj]XYg'i dXUhy'g'cb'h\Y]f'gmghYa 'ghUh' g'cb'Hk]hyf''

; YbYfU`mž'UggYgga YbhiHug_g'a i ghVY'gi Va]hhYX'Y`YVWfcb]\WJ``mij]U'Y]h\Yf'Hi fb]h]b'cf'U'A ccX`Y Ugg][ba Ybh''=b']bgHJb\W'g'k \YfY'h\]g']g'bchdcgg]V`Yž']hk]```VY'gHJhYX'cb'mci f'\\circ i fgY'g'A ccX`Y'g]hY'k]h\U`hYfbUh]j Y'gi Va]gg]cb'XYHJ]`g"

cfi]bZcfa Uhjcbicbi\ckihcigi Va]hUgg][ba Ybhgicbi]bYij]UiA ccXiY.i\hdg.#gh XYbhi bgk "YXi "Ui #\ck! gi Va]hUgg][ba Ybha ccXiY

5 WUXYa]W<cbYghmUbX D`U[]Uf]ga

D`U[]Uf]ga i]gii g]b[ih\Yik cfXgicfi]XYUgicZch\YfgiUbXidfYgYbh]b[ih\Ya iUgimci fick b"i=hWJbihU_Yia Ubm Zcfa gžZfca iXYi]VYfUhYiWXYUh]b[ihciUWW]XYbhU`mWcdm]b[iZfca iUigci fWYik]h\ci hiUW_bck iYX[Ya Ybh'

IBGK [fcidg'd'U[]Uf]ga]bhc'h\Y'Zc``ck]b['WUhY[cf]Yg.

• i bXYfgHJbX'mci f'f][\hg'UbX'fYgdcbg]V]`]h]Yg'Ug'U'gh XYbh'Uhil BGK

5WUXYa]W±bZcfaUhjcb

: cf'YggYbhJU`ghi XYbh]bZcfa UhJcb'fY`UhJb['hc.

• fYei Yghg Zcf Yl hYbg]cb/