



7ci fgY`Cj Yfj]Yk

GHJZZ`7cbHJW`8YHJ]`g

7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`]m	@cWU]cb	D\cbY
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@Ua YYg`5`?]m a]	"U`]m a]4 i bgk "YXi "Ui	D`YUgY`WcbHJW]j]U A G`HYUa g`cf Ya U]`		
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GWcc``7cbHJW`bZcfa Uh]cb

GWcc``cZD\ctcj c`hU]WUbX`F YbYk UV`Y`9bYf[mi9b[]bYYf]b[


9a U]: [gdfYhYUWX\]b\] 4 i bgk "YXi "Ui](#)

@YWhi fY'gYgg]cbg'k]'']bhfciXi Wf' hYcfmUbX'k cf_YX'YI Ua d'Yg''K cf_g\cdg'UfY'XYg][bYX'hc'XYj Y'cd fY'Yj UbhdfcV'Ya 'gc'j]b['g_]''g''8i f]b['gca Y'k cf_g\cd'WUggYgž'gh' XYbhg'k]'' [c'h'fci [\''UV'YI YfW]gYg UbX'UggcW]UHYX'Ugg][ba Ybhg'k \]W'k]''\Y'd'gh' XYbhg'hc'XYj Y'cd'g_]''g'fY'UHYX'hc'h'Y'i gY'cZgcZk UfY'Zcf a cXY'j]b['gc'Uf'W'g'UbX'a cXi 'Ygž'dfUW]W'g_]''g'fY'UHYX'hc'UggYa V'j]b['UbX'a YUgi f]b['h'Y'dYfZcfa UbVW cZd\c'hcj c'hU]Wgmg'hYa g'UbX'g_]''g'fY'UHYX'hc']bh'fd'fY'h]b['YI dYf]a YbhU'fYgi 'hg''E i]nnYg'UfY'XYg][bYX'hc \Y'd'k]h'V'cb]bi ci g'YUfb]b['UbX'_bck 'YX[Y'Yb\UbVW'a Ybh'H\Y'DJ 'gmg'hYa 'XYg][b'Ugg][ba Ybhk]''\Y'd hc'XYj Y'cd'g_]''g'bYYXYX'Zcf'DJ 'gmg'hYa g'XYg][b''

5XX]h]cbU'7ci fgY' bZcfa Uh]cb

Mci 'UfY'YI dYW]X'hc'UHY'bX'U''YWhi fYgž'k cf_g\cdg'UbX'UVg'j]b'cfXYf'hc'a UI]a]gY'YUfb]b["' b'UXX]h]cb'hc h'Y''YWhi fY'bc'h'g'UbX'fYV'cfX]b[gž'mci 'k]''VY'YI dYW]X'hc'fYUX'fY'Yj Ubh'YI hg'Ug'fYei]fYX''; fci d'YUfb]b[]g'YbV'ci fU[YXž'Vi hUbmgi Va]h'YX'k cf_'a i ghVY'gc'Y'mmci fgž'Ug'UWV'cfX]b['hc'Gh'XYbhF Ygdcbg]V']h'Yg UbX'7cbXi W'i' B'G'K 'Uggi a Yg'h'Uh'g'Y'Z'X]fYW]X'gh' XmcZ'h.]g_]''bX']g'i bXYftU_Yb']b'UXX]h]cb'hc'UHY'bX]b[ZJW'!hc'ZJW'WUggYg'h'fci [\ci h'h'Y'V'ci fgY''

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h'gca Y'k YY_g'fŸY'hY'gWXYXi 'YŸ'mci 'k]'k cf'_cb'UV'dfc'YWŸ'k \]W'UfY'XYg][bYX'hc' [] Y'mci 'Ub
cddcfh b]m]hc'Udd'm_bck'YX[Y'hc'dfUW]W]d'fcV'Ya g'fY'U]b['hc'gc'Uf'W'g'UbX'gmghŸa g'"Mci 'k]'bYXX'hc
k f]h'U'fYdcfŸ'Zc'f'YUW'UV'Ub'gk Yf]b['gdYW]Wei Ygh]cbg"

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H\Y'DJ'XYg][b'Ugg][ba Ybhk]' [] Y'mci 'cddcfh b]h]Yg'hc'Udd'm_bck'YX[Y'hc'UXXfYgg'dfUW]W]d'fcV'Ya g
UbX'dfYgYbh]h]hc'ghU_Y\c'XYfg'"Mci 'k]'dYfZcfa 'ghUbx'U'cbY'DJ'gmghŸa'XYg][b'Zc'f'U' [] Yb'dfcVY'a
]b'Wi X]b['g]n]b['UbX'gY'YW]cb'cZWca dcbYbh]UbX'YWcbca]WUbU'm]g'"

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Gh XYbŸ'g'a i ghXYa cbghfUHŸ'hYmW]b'XYg][b'U'ghUbx!U'cbY'DJ'gmghŸa'Zc'f'cd]ja i a 'dYfZcfa UbW'UbX
WcbZcfa UbW'hc'fY'Yj Ubh5i ghfU]Ub'GhUbxUfXg'"5'a]b]a i a 'a Uf_cZ*\$i 'a i ghVY'cVh]bYX']b'hY'DJ
gmghŸa'XYg][b'Ugg][ba Ybh]b'c'fYf'hc'dUgg'h]g'Wci fgY": U]i fY'hc'UWX]Yj Y'h]g'a]b]a i a 'a Uf_k]'fYgi 'h
]b'Ub'i bgU]hg]W]c'fm]Z]'fi : Ÿ[fUXYžfY[UfX'Ygg'cZ'hY'dYfZcfa UbW']b'hY'fYghcZ'hY'Wci fgY"

5 hYbXUbW`F Yei]fYa Ybhg

Gh XYbhg`UFY`gfc b[`mYbWci fU[YX`tc`UthYbX`U`WUggYg`UbX`fYj`]Yk`YWhi`fY`fYWcfX]b[`g"

7 ci fgY`GW`YXi`Y`

[J`Yk`WUgg`ha`YhUV`Y`](#)

H]a`YhUV`Y`

8UhY	HmdY	7cbhYbh
K YY_`%`%(` : YVfi Ufm! %` : YVfi Ufm	@YWhi`fY	DJ`GmghY`a`g`UbX`Wca`dcbYbhg/GDG`XYg][`b`fH!` @cUX`UggYgga`Ybh
	@UVcfUhcfm	@UV`\$.`7`]fW`]hg]a`i`Uhc`b`k`]h`@H`Gd]W
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	K`cf_g`l`cd	K`?`G`%`DJ`gmgH`Y`a`g`UbX`c`UX`UggYgga`Ybh
K YY_`"`. `&`,` : YVfi Ufm! (`A`UfW	@YWhi`fY	Gc`Uf`W`g`UbX`a`cXi`Yg`fH
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K YY_`*`,`&%`A`UfW`!`&` A`UfW		:`YI`]V`]mK`YY_`7`UggYg`k`]`bchfi`b`h`]g`k`YY_`
K YY_`+`,`&`,`A`UfW`!`%` 5df]`	@YWhi`fY	Gc`Uf`W`g`UbX`a`cXi`Yg`fH/GDG`XYg][`b`fH`-`DJ` 5ffUm
	@UVcfUhcfm	@UV`&`,`A`]ga`UW`Z`=]`UbX`h`Yfa`U`dfcd`Yfh]Yg`cZDJ` a`cXi`Yg
K YY_`,`(``5df]`!`,`5df]`	@YWhi`fY	GDG`XYg][`b`fH!`7`Uf[`Y`Wcb`f`c`Yf`UbX`]bj`YfhYf
	K`cf_g`l`cd	K`?`G`"`,`Gc`Uf`fYgci`fW`UggYgga`Ybh
K YY_`-`,`%`5df]`!`%` 5df]`	@YWhi`fY	DJ`gmgH`Y`a`dYfZ`cfa`UbW`UbX` YW`bca`]Wg`-`hghU`Uhc`b`Z`XYg][`b`UbX`W`gh]b[
	K`cf_g`l`cd	K`?`G`(``DJ`gmgH`Y`a`g`UbX`Wca`dcbYbhg
K YY_`%`\$`,`%`5df]`!`&&` 5df]`	@YWhi`fY	C`h`Yf`DJ`Udd`]W]h]cbg
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F YZfYbW`6cc_g`

K Yb\Ua žG"ž; fYYbžA "žK UhtžA "/`7cf_]g\žF "f&\$\$-Ł5dd]YX`D\cfcj c`hU]Vg`!`&bX`9X]hcbž&\$\$-
F Yj]g]cbžGmXbYnž5i gfU`]UžI BGK`7YbhfY`Zcf`D\cfcj c`hU]W9b[]bYYf]b["

GcZk UfY

@H`Gd]WV.`\hfdg.##k k k "UbU`c["Wca`#Yb#XYg][b!WbhfYf#XYg][b!hcc`g!UbX!WU`W`Uhcfg#hgd]W]g]a i`UhcF`ha`

F YhgWfYYb.`9bYf[mDfc`YWh5bU`mg]g`GcZk UfY`\hfd.##k k k "fYhgWfYYb`bYh#Ub[#ca`Y`d\`d

DJ GMGH.`GcZk UfY`Zcf`d\cfcj c`hU]WGmghYa`g`\hfd.##k k k "dj`gmgh`Wca`#

Cb!`]bY`F Ygci fWg

DJ`9Xi`WU]cb.`DJ`9Xi`WU]cb`]g`Ub`cb`]bYž`]bhfUW]j`Y`k`YVg]hY`Vm7`"6" <cbgVYf[`UbX`G"6`ck`XYb`Wc]`Yf]b[
a`Uhf]U`g]a`]Uf`hc`h]g`hY`hVcc_]g`U`gc`Uj`U]UV`Y`Uh`\hfd.##k k k "dj`YXi`WU]cb"cf[#dj`VXfca`#

A`ccXY.`5g`U`dUfhcZ`hY`hYUW]b[`Wca`dcbYbžž`A`ccXY`k`]`VY`i`gYX`hc`X]ggYa`]bUhf`hYUW]b[`a`Uhf]U`gž
\cghZcfi`a`g`UbX`c`WU]g]cbU`mei`]nnYg"5bbci`bW`a`Ybhg`WcbWf]b[`Wci`fgY`]bZcf`a`U]cb`k`]`VY`[`]j`Yb`]b
hY`Y`W`h`fYg`UbX`#f`cb`A`ccXY"5ggYgga`Ybha`Uf_g`k`]`U`gc`VY`a`UXY`Uj`U]UV`Y`j`]U`A`ccXY.
\hfdg.##a`ccXY"hf`h`i`bgk`"YXi`"Ui`#c[`]b#bXYI`"d\`d"

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

:`YYXVUW`_`cb`hY`Wci`fgY`]g`[`U`hY`fYX`dYf]cX]WU`mi`g]b[`]j`Uf]ci`g`a`YUbgž`]bWi`X]b[`]hY`I`BGK
a`m9I`dYf]YbW`d`f`c`W`ggž`]bZcf`a`U`X]gW`gg]cb`]Xi`f]b[`]hY`hY`fa`ž`UbX`hY`G`W`cc`g`G`h`XYbh`G`H`U`Z`a`Y`h]b[`]g`
Mci`f`ZYXVUW`_`]g`hU`_`Yb`gYf]ci`g`mž`UbX`Wcb]bi`U`]a`dfcj`Ya`Ybhg`UfY`a`UXY`hc`hY`Wci`fgY`VUgYXž`]b`dUfž`cb
gi`W`ZYXVUW`"

⊕`h]g`Wci`fgYž`fYW`bh]a`dfcj`Ya`Ybhg`fYgi`h]b[`]Zca`g`h`XYbhZYXVUW`_]bWi`XY`fYa`cj`U`c`Z`bcb!W]h]WU`
ei`Yg]hcbg`Zca`U`V`Ugg][`ba`Ybhgž`UbX`]bWYUg]b[`]hY`k`Y][`h]b[`]Zcf`hY`DJ`ghU`bX!`U`cbY`DJ`gmghYa`XYg][`b
Ugg][`ba`Ybhf`:]`]bU`YI`Ua`U`g`U`gc`VYYb`fYa`cj`YX"

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

I BGK `Ug`Ub`cb[c]b[`Wca a]ha Ybhlc`ZcghYf]b[`U`W`hi`fY`cZ`YUfb]b[`]bZcfa YX`VmiUWUXYa]W]bhY[f]m`5`
I BGK `gh`XYbhg`Uj`Y`U`fYgdcbg]V`]hmlc`UX`YfY`hc`h`g`df]bW]d`Y`cZUWUXYa]W]bhY[f]m`D`U[]Uf]ga
i bXYfa]bYg`UWUXYa]W]bhY[f]m]UbX`]g`bchlc`YfUHX`Uhl`BGK`"B`SY[Sde_`SfG@E|`[e VWX` VW`Se ge[`Y`
fZWi`ad/e`ad[VWSe`aXafZW`S`V`bSee[`Y`fZW_`aXSe`kagdai`ž`

D`U[]Uf]ga`]g`U`hmdY`cZ]bhY`YW`i`U`h`YZ`i`#iW]b`hU`_Y`a`UbmiZcfa`gž`Zca`XY`]VYfUHX`WX`YU]b[`hc`UWUXYbH`U`m`
W`dm]b[`Zca`U`gci`fW`k`]h`ci`hUW`bck`YX[`Ya`Ybh`I`BGK` `Ug`dfcXi`W`X`U`k`YVg]h`k`]h`U`k`YU`h`cZ`
fYgci`fW`g`hc`gi`ddcfhgh`XYbhg`hc`i`bXYfgHbX`UbX`Uj`c]X`d`U[]Uf]ga`ž`]g]h`[gh`XYbh`i`bgk`"YXi`"Ui`#d`U\[\]Uf\]ga`"](#)
H`Y`@YUfb]b[`7`YbhY`Ugg]ghg`gh`XYbhg`k`]h`i`bXYfgHbX]b[`UWUXYa]W]bhY[f]m]UbX`ck`bchlc`d`U[]Uf]gY`
H`Y`miU`gc`lc`X`k`cf_g`l`cdg`UbX`W]b`Y`d`gh`XYbhg`cbY!`cb!`cbY`"

Mci`U`fY`U`gc`fYa`]bXYX`h`UhWUfYZ`h`a`Y`a`UbU[`Ya`Ybh]g`Ub`ja`dcfHbhdUfHcZgh`XmiUbX`cbY`cZ`h`Y`
]X`Ybh]Z`Y`X`W]i`gYg`cZ`d`U[]Uf]ga`]g`d`ccf`h`a`Y`a`UbU[`Ya`Ybh`G`h`XYbhg`g`l`ci`X`U`ck`gi`Z`W]Y`bh`h`a`Y`Z`c`f`
fYgYUfW`ž`X`fU`Z]b[`UbX`h`Y`dfcdYf`fY`Z`fY`bW]b[`cZ`gci`fW`g`]b`dfY`dUf]b[`U`UggYgga`YbhH`g_g`"

ž`d`U[]Uf]ga`]g`Z`ci`bX`]b`mci`f`k`cf`_`k`Y`b`mci`U`fY`]b`Z`fghmY`Ufž`mci`f`Y`W`i`fY`f`k`]`c`Z`Y`f`mci`Ugg]ghU`bW`hc`
]a`dfcj`Y`mci`f`UWUXYa]Wg_]`g`"H`Y`ma`UmUg`_`mci`hc`cc`_`Uh`gca`Y`cb`]bY`fYgci`fW`gž`U`h`Y`bX`h`Y`@YUfb]b[
7`YbhY`ž`cf`gca`Y`h`a`Yg`fYgi`Va`]h`mci`f`k`cf`_`k`]h`h`Y`dfcV`Ya`Z]`YX`"<ck`Yj`Yf`a`cfY`gYf]ci`g`]bgH`bW`g`]b`Z`fgh`
mY`Ufž`gi`W`Ug`gh`U`]b[`Ubch`Y`f`gh`XYbhg`k`cf`_`cf`dU]b[`gca`YcbY`hc`Xc`mci`f`k`cf`_`ž`a`UmVY`]bj`Ygh[`UH`X`
i`bXYf`h`Y`G`h`XYbhA`]gW`b`Xi`W`h`D`fc`W`Xi`fYg`"

F`YdYUHX`d`U[]Uf]ga`fYj`Yb`]b`Z`fghmY`Ufž`d`U[]Uf]ga`U`Z`Y`f`Z`fghmY`Ufž`cf`gYf]ci`g`]bgH`bW`gž`a`UmU`gc`VY`
]bj`Ygh[`UH`X`i`bXYf`h`Y`G`h`XYbhA`]gW`b`Xi`W`h`D`fc`W`Xi`fYg`"H`Y`d`Yb`U`h`Y`g`i`bXYf`h`Y`dfc`W`Xi`fYg`W]b`]bW`i`XY`
U`fY`Xi`W]c`b`]b`a`Uf`gž`Z]`]b[`U`W`i`fgY`cf`Z`c`f`h`Y`a`cghgYf]ci`g`a`UH`Y`fg`f]`_`Y`d`U[]Uf]ga`]b`Ub`l`cbci`fg`
h`Y`g]g`L`Yj`Yb`gi`gdYbg]cb`Zca`h`Y`i`b]`Yfg]m`H`Y`G`h`XYbhA`]gW`b`Xi`W`h`D`fc`W`Xi`fYg`UfY`Uj`U]UV`Y`Y`fY`.

[k`k`k`"\[g`i`bgk`"YXi`"Ui`#d`U\[\]Uf\]ga`\]W<`cbYgmiUbX`D`U\[\]Uf\]ga`\]gW`b`Xi`W`h`D`fc`W`Xi`fYg`"dXZ`](#)

