

; f]YWXYb`UbX'VY]a '9G7'&\$&). 'Gc gh]a a Yb'G]Y'ZØf'5ghYfca UhU'UV'

9fZU\fYb'G]Y'U``Yg'ØVYf'XYb'9G7'&\$&) ž'; f]YWXYb`UbXg 6Y]hfU['i bX'k]Y'G]Y'ZØf'5ghYfca UhU'UVgh]a a Yb'_ÒbbYb" 6`Y]VYb'G]Y']bZcfa]Yfh'



; f]YWXYb`UbX'!:5a '%) "'A U]'&\$&) 'ghY\h'XYf'9i fcj]g]cb'Gcb[
7cbhYgh'fPG7Ł']a 'A]hhY`di b_h'XYg' \(\bar{\text{b}}\) hYfYggYgž'gdYn]Y``'X]Y
[f]YWX]gWXY'? UbX]XUh]b'?`Uj X]U"' \(\arthred{\text{c}}\) f'@]YX' 5ghYfca UhU '\Uh'VYfY]hg
j]Y`Y'Ni gWXUi Yf'i bX': Ubg']b'gY]bYb'6Ubb'[Ync[Yb"'I a 'ZØf
?`Uj X]U'ni 'gh]a a Ybž'[]Vh'Yg'j YfgWX]YXYbY'A Ò[`]WX_Y]hYbž'X]Y'j cb
XYb'Cf[Ub]gUhcfYb'VYfY]h[YghY``h'k YfXYb"'@Ui h'a Un!cb`]bY"XY
_`ObbYb'X]Y'Ni gWXUi Yf'ØVYf'X]Y'c\(\bar{\text{Z}}\)]n]Y``Y'9G7!5ddž'HY`Y!J ch]b[
gck]Y'cb`]bY'Ui Z'XYf'9G7!K YVg]hY']\fY'Gh]a a Yb'UV[YVYb"

8 Yf '9G7 ']gh'b]W\h'bi f'Y]b'K Yhh_Ua dZ'XYf'VYghYb'Gh]a a Ybž gcbXYfb'Ui W\'Y]b'GW\a Y`nh]Y[Y`'_i `hi fY``Yf'5i gXfi W_gZcfa Ybž'X]Y ghUf_'a]h'9a ch]cbYb'j YfVi bXYb'g]bX"'?`Uj X]U'[fY]Zh']b']\fYa GhØW_'H\Ya Yb'Ui Zž'X]Y'X]Y'a YbgW\`]W\Y'9fZU\fi b['k]XYfgd]Y[Y`b"; YfUXY'XYf'I a [Ub['a]h'XYa 'HcX'i bX'XUg'; YZØ\``XYf JYf[Åb[`]W_Y]h'g]bX'nYbhfU`Y'A ch]j Yž'X]Y'Ui W\']b'XYf'@mf]_'\Ài Z][

VY\UbXY`h'k YfXYb"']d]f"Uh'\YVh'\Yfj cfž'XUgg'XYf'HcX']b'XYf

DcYg]Y'U`g'GW\`ØggY`a ch]j 'Zi b[]Yfhž'k Y`W\Yg'[fi bX`Y[YbXY
: fU[Yb'XYg'@YVYbg'VY\UbXY`h"; YX]W\hY'h\Ya Uh]g]YfYb'cZh

K UbXY`i bX'X]Y'Ya ch]cbU`Y'FYU_h]cb'Ui Z'XUg'@YVYbgYbXY'fY]W\h
j cb'HfUi Yf'V]g'\]b'ni '5_nYdhUbn"

8Yf'HcX']b'XYf'?ibgh

#D'XYf'?i bgh'i bX'@]hYfUhi f'k]fX'XYf'HcX'gY]h'#J\f\i bXYfhYb
i bhYfgi W\h''Gc'k]fX'Yf']b'j YfgW\]YXYbYb'?i `hi fYb'i bX'9dcW\Yb
i bhYfgW\]YX`]W\']bhYfdfYh]Yfh'''9]b'ghUf_Yg'6Y]gd]Y`'\]YfZØf']gh'X]Y
Ubh]_Y'?i bghž'k Y`W\Y'f]hi Y``Y'Nk YW_Y'VYgU»'i bX'XYb'; `Ui VYb'Ub
Y]b'@YVYb'bUW\'XYa 'HcX'j Yf_ÒfdYfhY'''9]b']_cb]gW\Yg'8Yb_a U`
XYf'8]YgVYnØ[`]W\Yb', VYfnYi [i b[Yb']gh'X]Y'HchYba Ug_Y'XYg
Hi hUbW\Ua i bž'X]Y'X]Y'FY]gY']bg'#bgY]hg'gma Vc`]g]Yfhž'k]Y'
dUf_ghcbY"]bhYfbUh]cbU``XUfghY``h''

A]hhY`U`hYf`\]b[Y[Yb`k i fXY`XYf`HcX`\Ài Z][`Xi fWX`XYb HchYbhUbn `h\Ya Uh]g]Yfhž`XYf`Y]bYb`ZUgn]b]YfYbXYb`9]bV`]W_`]bX]Y`[YgY``gWXUZh`]WXYb`Bcfa Yb`i bX`5i ZZUggi b[Yb`X]YgYf`NY]h[]Vh"`Gc`WXY`8 UfghY``i b[Yb`Yfa Ò[`]WXYb`Y]bY`h]YZYfY`FYZYI]cb@VYf`X]Y`GhYfV`]WX_Y]hii bX`X]Y`[YgY``gWXUZh`]WXY`K U\fbY\a i b[XYg`HcXYg"`8]Y`?i bgh`\Uh`gca]hY]bY`YggYbh]Y``Y`Fc``Y`]b`XYf5i gY]bUbXYfgYhni b[`a]h`XYf`JYf[Àb[`]WX_Y]h`[Ygd]Y`hž`k cXi fWXb]WXh'bi f`]bX]j]Xi Y``Y`9fZU\fi b[Ybž'gcbXYfb`Ui WX`_c``Y_h]j YHfUi Yf`i bX`9f]bbYfi b[Yb'j YfUfVY]hYh'k YfXYb"

9a ch]cbU`Y`FYU_h]cbYb`i bX`_i `hi fY``Y F]hi U`Y

9a ch]cbU`Y`FYU_h]cbYb`Ui Z`XYb`HcX`g]bX`j]Y`ZÀ`h]['i bX`fY]W\Yb j cb`J Yfnk Y]Zi b[`V]g`\]b`ni `Hfcghžk]Y`YVYbZU``g`VY]`]d]f"Uh`ni `YgYb`]gh"`8]YgY`FYU_h]cbYb`k YfXYb`]b`XYf`a cXYfbYb`DcYg]Y Xi fW\`cZZYbYfY`i bX`dYfgÒb`]W\YfY`DYfgdY_h]j Yb`Ui Z`HfUi Yf`i bX JYf[Àb[`]W_Y]h`Yf[Àbnh"`\D`XYb`[Y[Ybk Àfh][Yb`_Øbgh`Yf]gW\Yb 8]g_i fgYb`nY][h`g]W\`X]Y`J YfV]bXi b[`nk]gW\Yb`@YVYb`i bX`HcXžk cVY]`hfUX]h]cbY``Y`F]hi U`Y`i bX`6fÀi W\Yž`X]Y`a]h`XYa `GhYfVYb

Uggcn]]Yfh'g]bXž'XUg'_c``Y_h]j Y'; YXÀW\hb]g'dfÀ[Yb'i bX'FUi a 'ZØf FYZYI]cb'i bX'k i bXYfj c``Y'9f]bbYfi b[Yb'gW\UZZYb"

±g[YgUa hghY``h'XYf'HcX'gY]h'Y\Yf'Y]b'Zi bXUa YbhU`Yg'H\Ya U']b?i bgh'i bX'@]hYfUhi f'XUf"'9f'ZÒfXYfh'b]W\h'bi f'X]Y'8]g_i gg]cb'ØVYf9h\]_'i bX'A cfU`ž'gcbXYfb'fY[h'Ui W\ni f'h]YZYb'GY`VghfYZYI]cb'Ub"Gca]h'_ca a h'XYf'Gh]a a Y'j cb'?`Uj X]U'VY]a '9G7'Y]bY'VYgcbXYfY6YXYi hi b['ni ž'XU'g]Y'Xi fW\']\fY'A i g]_'\cZZYbh`]W\'b]W\h'bi f'ZØfXYb'K YhNYk YfVž'gcbXYfb'Ui W\'ZØf'h]YZ[Y\YbXY'Ya ch]cbU`Y9f`YVb]ggY'gcf[h"

8 YhU]`g	
Cfh	; f]YWXYb`UbX
EiY``Yb	• k k k "a Un!cb`]bY"XY
	• k k k "]d]f"Uh
	 d Uf_ghc b Y "]b hY fb Uh]c b U`

6Ygi WXYb G]Y i bg Ui Z b!U["XY