

# 8]Y'%\$'VYghYb'GY\Ybgk ØfX][\_Y]hYb']b 9ggYb'!'9]b'FY]gYZØ\fYf

9ggYb / Ua d/, & %%/'9]b Y 'GhUXh'j c``Yf'GY\Ybgk ØfX][ \_Y]hYb 9ggYb ']gh'Y]bY 'U`hY'i b X 'ghc`nY 'GhUXh']a '< YfnYb 'XYg Fi\f[YV]Yhg']b '8 Yi hgW\`UbX"'9g']gh'Y]bY 'XYf'[ fò> hYb ii b X k ]W\h][ ghYb '♣ Xi ghf]Ygh\AXhY 'XYg'@UbXYg'i b X'Y]b 'k ]W\h][ Yg NYbhfi a 'ZØf'?i `hi f'i b X'?i bgh"'9g'[ ]Vh'j ]Y`Y GY\Ybgk ØfX][ \_Y]hYb ']b '9ggYb ž'X]Y 'Y]bYb '6Ygi W\`k Yfh'g]bX" ♣ 'X]YgYa 'FY]gYZØ\fYf'k YfXYb 'X]Y '%\$ 'VYghYb GY\Ybgk ØfX][ \_Y]hYb ']b '9ggYb'j cf[ YghY``h"'%" 'NYW\Y Nc``j YfY]b '8]Y 'NYW\Y 'Nc``j YfY]b '8]Y 'NYW\Y 'Nc``j YfY]b '8]Y 'NYW\Y 'Nc``j YfY]b '8]Y 'NYW\Y 'Nc``j YfY]b '9j fcdUg'[ Y\Òfh" < Yi hY ']gh'X]Y 'NYW\Y 'Nc``j YfY]b 'Y]b '?i `hi fnYbhfi a ž'XUg'6Ygi W\Yfb 'Y]bY Y]bn][ Ufh][ Y'9]bV`]W\_Y']b 'X]Y'; YgW\]W\hY'XYf' ♣ Xi ghf]Y'XYf FY[ ]cb'V]YhYh"'9q'[ ]Vh'Ui W\"j ]Y`Y ' Ua d\Y``]d/

# 9ggYb`'9]bY'GhUXh'jc``Yf GY\Ybgk ØfX][\_Y]hYb

# %"'NYWXY'Nc``jYfY]b

8]Y'NYW\Y'Nc``j YfY]b']gh'Y]b'Y\Ya U`][Yg'?c\`YVYf[k Yf\_ž'XUg'ni XYb'VYXYi hYbXghYb'=bXi ghf]YXYb\_a À`Yfb'9i fcdUg'[Y\Òfh"<Yi hY]gh'X]Y'NYW\Y'Nc``j YfY]b'Y]b'?i `hi fnYbhfi a ž'XUg'6Ygi W\Yfb'Y]bY

 $Y]bn][Ufh][Y'9]bV`]W_Y']b'X]Y'; YgWX]WXhY'XYf' <math>\Rightarrow$  Xi ghf]Y'XYf'FY[]cbV]YhYh'''9g'[]Vh'Ui WX'j]Y`Y'?i bgh[U`Yf]Ybž'A i gYYb'i bX JYfUbghU`hi b[gcfhYž'X]Y'6Ygi WXYf'VYgi WXYb'\_ÒbbYb''

# &"'Fi\f'AigYia

8 Ug'Fi\f'AigYia']gh'Y]bYg'XYf'VYXYihYbXghYb'AigYYb']b'9ggYb" 9g'V]YhYh'Y]bY'ia ZUggYbXY'9]bZØ\fib[']b'X]Y'; YgWX]WXhY'XYg Fi\f[YV]Yhg'ibX'gY]bYf'AYbgWXYb"'9g'VY\YfVYf[h'UiWX'Y]bY GUaa`ib['jcb'?ibghkYf\_Ybž'X]Y'X]Y'?i`hif'ibX'X]Y'; YgWX]WXhY XYf'FY[]cb'k]XYfgd]Y[Y`b"

# ' "; fi [ UdUf\_

8 Yf; fi [ UdUf\_']gh'Y]b'k Y]h'Ài Z][ Yf'DUf\_']b'9ggYbž'XYf'ZØf'gY]bY gWX ObYb'; ÀfhYb'i bX'gY]bY'fY]WXY': `cfU'i bX': Ui bU'VY\_Ubbh']gh" 9g'[ ]Vh'Ui WX'Y]bYb'Nccž'Y]b'5ei Uf]i a 'i bX'Y]b'Ai gYi a ']a 'DUf\_ž X]Y'6Ygi WXYf'VYgi WXYb'\_ObbYb"'8Yf'DUf\_']gh'Y]b'VY`]YVhYg 5i gZi [ gn]Y``ZØf': Ua ]`]Yb'i bX'Y]b'[ fc»Ufh][ Yf'Cfhž'i a 'X]Y'BUhi f ni '[ Yb]Y» Yb"

# ("5`hYGmbU[c[Y

 $8 ]Y \cdot 5 `hY \cdot Gmb \cup [c[Y \cdot ]gh \cdot Y]b \cdot VYXYi hYbXYg \cdot \] ghcf]gWX Yg \cdot; YV Ai XY \cdot \] b \\ 9ggYb " \cdot 9g \cdot \] gh \cdot Y]b Yg \cdot XYf \cdot A `hYghYb \cdot; YV Ai XY \cdot XYf \cdot GhUXh \cdot i bX \cdot Y]b \\ Gma Vc ` \cdot 7Øf \cdot X]Y \cdot \langle \emptyset X]gWX Y \cdot; Ya Y]b XY \cdot \] b \cdot 9ggYb " \cdot < Yi hY \cdot \] gh \cdot Yg \cdot Y]b \\ A i gYi a ž \cdot XUg \cdot 6Ygi WX Yfb \cdot Y]b Yb \cdot 9]b V `]W_ \cdot \] b \cdot X]Y \cdot \langle \emptyset X]gWX Y \\ ; YgWX \] WX hY \cdot XYf \cdot FY[ ]cb \cdot V]YhYh"$ 

## ) "'GWX `cgg'6cfVYW\_

GWX`cgg`6cfVYW\_`]gh`Y]b`a ]hhY`U`hYf`]WXYg`GWX`cgg`]b`9ggYb"`9g`]gh Y]bY`XYf`À`hYghYb`GY\Ybgk ØfX][ \_Y]hYb`XYf`GhUXh`i bX`Y]b VY`]YVhYg`N]Y``ZØf`6Ygi WXYf"`< Yi hY`]gh`XUg`GWX`cgg`Y]b`A i gYi a ž XUg`6Ygi WXYfb`Y]bYb`9]bV`]W\_`]b`X]Y`; YgWX]WXhY`XYg`GWX`cggYg i bX`XYf`FY[ ]cb`V]YhYh"

## \* "'J]``U'<Ø[Y`

 $\label{eq:continuous} $J_{\tilde{Y}}^{\tilde{Y}} = \emptyset[Y_{\tilde{Y}}] b_{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^{\tilde{Y}}^{\tilde{Y}} b_{\tilde{Y}}^$ 

#### +"6UXYbYmgYY

8 Yf'6U`XYbYmgYY']gh'Y]b'VY`]YVhYg'5i gZi [gn]Y`']b'9ggYb"'9g']gh'Y]b VY`]YVhYf'Cfh'ZØf'K UggYfgdcfh'i bX'9f\c`i b["'9g'[]Vh'Ui W\'j]Y`Y FYghUi fUbhg'i bX'7UZÅg'Ua 'I ZYf'XYg'GYYgž'X]Y'6Ygi W\Yf VYgi W\Yb'\_ÒbbYb"

#### , "'5 hY'?]fWXY

8]Y'5`hY'?]fW\Y']gh'Y]bY'U`hY'?]fW\Y']b'9ggYbž'X]Y']a '%&" \$\J\f\i bXYfh'YfVUi h'k i fXY"'< Yi hY']gh'Yg'Y]b'VY`]YVhYg'N]Y``ZØf 6Ygi W\Yfž'X]Y'X]Y'; YgW\]W\hY'i bX'?i `hi f'XYf'FY[]cb'Yf\_i bXYb a OW\hYb"

#### - "'5U`hc!H\YUhYf

8 Ugʻ5 U`hc!H\YUhYfʻ]ghʻY]bYgʻXYfʻVY\_UbbhYghYbʻH\YUhYfʻ]bʻ9ggYb" 9gʻ]ghʻY]bʻa cXYfbYgʻH\YUhYfžʻXUgʻ6Ygi W\YfbʻY]bYʻJ]Y`nU\`j cb A i g]WU`gžʻCdYfbʻi bXʻUbXYfYbʻ5i ZZØ\fi b[YbʻV]YhYh"ʻ9gʻ]ghʻY]b VY`]YVhYgʻN]Y``ZØfʻ?i `hi f]bhYfYgg]YfhY"

## %\$"@UbXgWXUZhgdUf\_'8i]gVif[!BcfX

8 Yf @Ub XgW UZhgd Uf\_'8 i ]gVi f[!BcfX']gh'Y]b'Y\Ya U`][Yg

\*DXi ghf]Y[Y`Àb XY ž'X Ug'ni 'Y]bYa 'VY`]Y VhYb'DUf\_'i a [YghU`hYh
k i fXY"'9g'V]YhYh'6Ygi W\Yfb'Y]bYb'Y]bn][Ufh][Yb'9]bV`]W\_']b'X]Y
; YgW ]W\hY'XYg'Fi\f[YV]Yhg"'9g'[]Vh'Ui W\'j]Y`Y'?i bgh[U`Yf]Ybž
A i gYYb'i bX'J YfUbghU`hi b[gcfhYž'X]Y'6Ygi W\Yf'VYgi W\Yb'\_ObbYb"

9ggYb']gh'Y]bY'XYf'[fÒ» hYb'i bX'k]Wkh][ghYb'GhÀXhY'XYg
Fi\f[YV]Yhg'i bX'V]YhYh'6Ygi WkYfb'Y]bY'J]Y`nU\`'j cb
GY\Ybgk ØfX][\_Y]hYb"'Jcb'\]ghcf]gWkYb'8Yb\_a À`Yfb'ØVYf'AigYYb
i bX'DUf\_g'V]g'\]b'ni 'H\YUhYfb'i bX'; U`Yf]Yb'[]Vh'Yg'j]Y`ni
YbhXYW\_Yb"'8]YgYf'FY]gYZØ\fYf'\Uh'Y]bY'5i gk U\`'XYf'%\$'VYghYb
GY\Ybgk ØfX][\_Y]hYb']b'9ggYb'j cf[YghY``h"'\XXY'GY\Ybgk ØfX][\_Y]h
V]YhYh'6Ygi WkYfb'Y]bYb'Y]bn][Ufh][Yb'9]bV`]W\_']b'X]Y'; YgWk]WkhY
i bX'?i `hi f'XYf'FY[]cb"

# $8Yf'6U'XYbYmgYY'''9ggYbg'VY']YVhYghYGY\Ybgk ØfX][_Y]h$

 $8 \ Yf'6U'XYbYmgYY']gh'Y]bY'XYf'VY`]YVhYghYb'GY\Ybgk \varnothing fX][\ \_Y]hYb \\ ]b'9ggYb'''9f'`]Y[\ h']a ''G\varnothing XYb''XYf'GhUXh'i bX'']gh'Y]b''VY`]YVhYg \\ 5i gZi [\ gn]Y'''Z\varnothing f'9]b\Y]a ]gW\Y'i bX''Hci f]ghYb'''8 Yf'GYY'']gh'Y]b \\ k ]W\h][\ Yg'BU\Yf\c`i b[\ g[\ YV]Yh'Z\varnothing f'X]Y''A YbgW\Yb'']b''XYf'FY[\ ]cb \\ i bX''V]YhYh'Y]bY'J]Y`nU\''j cb''5<math>\_$ h]j ]hÀhYb'i bX''5hhfU $\_$ h]cbYb''

#### 9]bn][Ufh][Y'BUhi f`UbXgWXUZh

8 Yf'6U`XYbYmgYY']gh'Y]b'VY`]YVhYg'BU\Yf\c`i b[g[YV]Yhž'XUg'ØVYfY]bY'Y]bn][Ufh][Y'BUhi f`UbXgW\UZh'j YfZØ[h"8Yf'GYY']gh') ž'?]`ca YhYf'`Ub['i bX'V]g'ni '%z' '?]`ca YhYf'VfY]h'i bX'V]YhYh'Y]bY J]Y`nU\`'j cb'5\_h]j ]hÀhYb"'9g'[]Vh'Y]bYb'GhfUbXž'XYf'ni a '6UXYb i bX'GcbbYbVUXYb'Y]b`ÀXh"'9g'[]Vh'Ui W\'Y]bYb'6cchgj Yf`Y]\`ž'XYf Yg'6Ygi W\Yfb'Yfa Ò[`]W\hž'XYb'GYY'Ui Z'XYa 'K UggYf'ni 'Yf\_i bXYb"

#### ?i `hi fY``Y 5 hhfU\_h]cbYb i bX 5\_h]j ]hÀhYb

 $8 \ Yf'6U`XYbYmgYY']gh'b]Wh'bifY]b'VY`]YVhYg'BU\Yf\c`ib[g[YV]YhžgcbXYfb'UiW\Y]b'VY`]YVhYg'N]Y`'ZØf'_i`hifY``Y'5hhfU_h]cbYb'''9g []Vh'Y]b][Y'\]ghcf]gW\Y'; YVÀiXYŽ'X]Y'Ua'IZYf'XYg'GYYg'ni'Z]bXYbg]bX'''8Uni'[Y\ÒfYb'XUg'GW\`cgg'6U`XYbYmž'XUg']a'%+"$J\f\ibXYfh'YfVUih'kifXYŽ'ibX'X]Y'J]``U'<<math>\emptyset[Y`Z'X]Y'Y]bgh'XYf'G]hnXYf':Ua]`]Y'?fidd'kUf''$ 

 $9g`[\ ]Vh`Ui\ WX`Y]b][\ Y`A\ i\ gYYb`Ua\ `I\ ZYf`XYg`GYYgž`XUfi\ bhYf`XUg$ 

AigYia 'ZØf'?ibgh'ibX'?i`hif[YgWx]WkhY'ibX'XUg'AigYia 'ZØf ±bXighf]Y\_i`hif"'5iWx'X]Y'Fi\f!Ib]jYfg]hÀh'VYZ]bXYh'g]Wk'Ua'IZYf XYg'GYYg"

9g'[]Vh'Ui W\'Y]bY'J]Y`nU\`'j cb'5\_h]j]hÀhYb'Ua '6U`XYbYmgYY"'9g
[]Vh'K UbXYf!'i bX'FUXk Y[Yž'X]Y'i a 'XYb'GYY'\Yfi a ZØ\fYbž'i bX
Yg'[]Vh'Ui W\'Y]b][Y'GhfUbXVUfgž']b'XYbYb'a Ub'g]W\'YbhgdUbbYb
i bX'X]Y'5i gg]W\h'[Yb]Y»Yb'\_Ubb"

# 9ggYbg VY`]YVhYghY GY\Ybgk ØfX][\_Y]h

8 Yf '6 U`XYbYmgYY']gh'Y]b'VY`]YVhYg'5i gZi [gn]Y``ZØf'9]b\Y]a ]gW\Yi bX'Hci f]ghYb'i bX'Y]b'Cfhž'Ub'XYa 'a Ub'g]W\'YbhgdUbbYb'i bX'X]Y 5i gg]W\h'[Yb]Y»Yb'\_Ubb"'9g']gh'Y]bY'XYf'VY`]YVhYghYb GY\Ybgk ØfX][\_Y]hYb']b'9ggYb'i bX'Y]b'Cfhž'Ub'XYa 'a Ub'X]Y GW\Ob\Y]h'XYf'BUhi f'i bX'X]Y'\_i `hi fY``Yb'5hhfU\_h]cbYb'XYf'GhUXh [Yb]Y»Yb'\_Ubb"

8 YhU]`g

6Ygi WXYb G]Y i bg Ui Z Y]bY!fY]gY "XY