

## HU[YgUigZ`i['GUW\gYb.'9bhXYW\_Y GUW\gYbg'jYfVcf[YbY'GW\AhnY

/ ei ch/9bhXYW\_Yb^G]Y^X]Y^fY]WXY^; YgWX]WXhY^i bX^?i `hi f GUWXgYbgžYf\_i bXYb^G]Y^X]Y^j YfVcf[YbYb^BUhi fgWX\Ob\Y]hYb i bX^[Yb]Y>Yb^G]Y^\_i `]bUf]gWXY^9bhXYW\_i b[Yb^VY]^Y]bYa HU[YgUi gZi ["'HUi WXYb^G]Y^Y]b^]b^X]Y^j ]Y^ZA`h][Y^K Y`h'j cb GUWXgYb^/ ei ch/



GUWX gYbžY]b '6i bXYg`UbX']a 'C ghYb '8 Yi hgWX`UbXgž'V]f[ h'Y]bY': Ø``Y j cb'fY]WXYf'; YgWX]WX hYž'UhYa VYfUi VYbXYf'@UbXgWX UZhi bX \_i `]bUf]gWXYb'; YbØggYb"' \delta X]YgYa '5fh]\_Y``k YfXYb'k ]f'Y]bY h]YZ[ fØbX][ Y'FY]gY'Xi fWX'X]Y'; YgWX]WX hY'i bX'?i `hi f'XYg 6i bXYg`UbXYg'i bhYfbY\a Ybž'j YfVcf[ YbY'B Uhi fgWX Ob\Y]hYb'i bX @UbXgWX UZhYb'YbhXYW\_Yb'i bX'[ Ughfcbca ]gWXY'9bhXYW\_i b[ Yb'Ui Z XYa 'HU[ YgUi gZi [ ']b'GUWX gYb'[ Yb]Y» Yb"'8 UVY]'k YfXYb'k ]f'X]Y Y]bn][ Ufh][ Y'J ]Y`ZU`h'i bX'GWX Ob\Y]h'X]YgYf'FY[ ]cb'[ YbUi Yf'i bhYf X]Y'@i dY'bY\a Yb'i bX']\fY'i bj Yfk YWX gY`VUfYb': UWYhhYb'bÀ\Yf VYhfUWX hYb"'6Y[ `Y]hYb'G]Y'i bg'Ui Z'X]YgYf'k ]ggYbgWX UZh`]WXYb 5bU`mgYž'i a 'GUWX gYb']b'U```gY]bYf'DfUWX hii bX'9]bn][ Ufh][ \_Y]h'ni

# ; $YgWX]WXhY'ibX'?i`hif.'9]bY'FY]gY'XifWXGUWXgYbg'fY]WXY'JYf[Ub[Yb\Y]h$

GUW gYbg fY]W Y; YgW ]W hY i bX ? i `hi f n]Y \ Yb '6 Ygi W Yf 'Ui g 'XYf [ Ub nYb 'K Y`h 'Ub " '8 ]Y F Y[ ]cb '\ Uh 'Y]bY 'ZUgn]b]Y fYb XY

J Yf[ Ub [ Yb \ Y]hž 'X]Y 'V]g ']b 'X]Y '5 bh]\_Y 'ni fØW\_fY]W h" '9[ U` cV

5 fW ]hY\_hi fž ? i bghž A i g]\_ 'c XYf '@]hY fUhi fž GUW gYb '\ Uh 'Y]bY 'V fY]hY

DU 'YhhY '\_i `hi fY ``Yf GW ÀhnY 'ni 'V]YhYb"

8]Y'gÀW g]gW Y'@UbXYg\Ui dhghUXh'8fYgXYb']gh'VYfØ\a h'ZØf']\fY VYY]bXfi W\_YbXY'5`hghUXhž'X]Y'bUW 'XYa 'Nk Y]hYb'K Y`h\_f]Y[ k]YXYf'Ui Z[YVUi h'k i fXY"'Ni 'XYb'<][\`][\hg'[Y\ÒfYb'X]Y'VUfcW\_Y : fUi Yb\_]fW Yž'XYf'Nk ]b[Yf'i bX'XUg'FYg]XYbngW `cgg"'8]YgY \]ghcf]gW Yb'; YVÀi XY'YfnÀ\`Yb'X]Y'; YgW ]W hY'GUW gYbg'i bX nYi [Yb'j cb'XYf'Y]bgh][Yb'DfUW h'i bX'; fÒ» Y'XYg'@UbXYg"

5VgY]hg'XYf'GhÀXhY'V]YhYh'GUWXgYb'Ui WX'Y]bY'fY]WXY
?i`hi f`UbXgWXUZh']a '`ÀbX`]WXYb'FUi a "'<]ghcf]gWXY'GWX`ÒggYfž
6i f[Yb'i bX'a U`Yf]gWXY'8 ÒfZYf'nYi [Yb'j cb'XYf'j]Y`ZÀ`h][Yb
JYf[Ub[Yb\Y]h'XYf'FY[]cb"'9]b'6Ygi WX']b'X]YgYb'`ÀbX`]WXYb
; Y[YbXYb'j YfgYhnh'6Ygi WXYf'ni fØW\_']b'Y]bY'NY]hž']b'XYf'5XY``i bX
<UbXk Yf\_'Y]bY'VYXYi hYbXY'Fc``Y'gd]Y`hYb"

⇒ 'GUW\ gYb'[]Vh'Yg'ni XYa 'nU\`fY]W\ Y'A i gYYbž'X]Y'9]bV`]W\_Y']b'X]Y
; YgW\]W\ hY'i bX'?i `hi f'XYf'FY[]cb'Yfa Ò[`]W\ Yb"'8 Ug'; fØbY
; Yk Ò'VY']b'8 fYgXYbž'XUg'A i gYi a 'XYf'V]`XYbXYb'? ØbghY']b
@Y]dn]['i bX'XUg'? Uf`!A Um'A i gYi a ']b'FUXYVYi `'g]bX'bi f'Y]b][Y
6Y]gd]Y`Y'ZØf'X]Y'j ]Y`ZÀ`h][Yb'\_i `hi fY``Yb'9]bf]W\ hi b[Ybž'X]Y'Yg']b
GUW\ gYb'ni 'YbhXYW\_Yb'[]Vh"

8]Y'gÀW\g]gW\Y'?ØW\Y']gh'[YdfÀ[h'jcb'fY[]cbU`Yb'GdYn]U`]hÀhYb"
6Y\_UbbhY'; Yf]W\hY'k]Y'GUiYfVfUhYbž'H\Øf]b[Yf'FcghVfUhkifgh
ibX'9]YfgW\YW\_Y'g]bX'bif'Y]b][Y'6Y]gd]Y`Y'ZØf'X]Y'\_i`]bUf]gW\Y
J]Y`ZU`h'GUW\gYbg"'+b'[Ya Øh`]W\Yb'; Ugh\ÀigYfb'ibX'FYghUifUbhg
\_`ObbYb'6YgiW\Yf'X]Y'fY[]cbU`Yb'?Ogh`]W\\_Y]hYb'dfcV]YfYb'ibX'gc
UiW\'Y]bYb'9]bV`]W\_']b'X]Y'[Ughfcbca]gW\Y'?i`hif'GUW\gYbg
[Yk]bbYb"

## BUhi fgW\Ob\Y]hYb'i bX'@UbXgW\UZh.'8]Y jYfVcf[YbYb'CUgYb'GUW\gYbg'YbhXYW\_Yb

- GÀWX g]gWX Y 'GWX k Y]n. '8]Y 'UhYa VYfUi VYbXY': Y`g`UbXgWX UZh XYf'GÀWX g]gWX Yb 'GWX k Y]n']gh'Y]b 'DUfUX]Yg 'ZØf'K UbXYfYf i bX'? `YhhYfYf" 'A]h']\ fYb 'a Uf\_UbhYb 'GUbXghY]b ZY`gYb'i bX h]Y ZYb 'GWX`i WX hYb'V]YhYh'g]Y 'gdY\_hU\_i `ÀfY'5i gV`]W\_Y'i bX i bi Yf[ `Y]WX`]WX Y 'B Uhi fYf`YVb]qqY"
- @Ui g]hnYf'GYYb`UbX.'8 Ug'@Ui g]hnYf'GYYb`UbX']gh'Y]bY'XYf [fÒ» hYb'j cb'A YbgWXYb'[YgWXUZZYbYb K UggYf`UbXgWXUZhYb'9i fcdUg"'A]h'ØVYf'&\$'\_Øbgh`]WXYb GYYbž'X]Y'Ui g'Y\Ya U`][Yb'HU[YVUi Yb'YbhghUbXYb'g]bXž `AXh'X]Y'FY[]cb'ni a 'K UggYfgdcfhž'FUXZU\fYb'i bX 9bhgdUbbYb'Ua 'I ZYf'Y]b"
- 9fn[YV]f[Y.'8 Ug'9fn[YV]f[Y']gh'gck c\`']a 'Gca a Yf'U`g Ui WX ']a 'K ]bhYf'Y]b'VY`]YVhYg'FY]gYn]Y`'ZØf B Uhi f`]YV\UVYf"'8]Y'j ]Y`ZÀ`h][Y'@UbXgWX UZh'a ]h'X]WX hYb K À`XYfbž'\_`UfYb'6ÀWXYb'i bX'a U`Yf]gWXYb'HÀ`Yfb'V]YhYh nU\`fY]WXY'K UbXYfa Ò[`]WX\_Y]hYb'i bX']a 'K ]bhYf'VYghY 6YX]b[i b[Yb'ni a 'G\_]ZU\fYb'i bX'Gbck VcUfXYb"

- B Uh]cbU`dUf\_'GÀWXg]gWXY'GWX k Y]n. '8 Yf'B Uh]cbU`dUf\_ GÀWXg]gWXY'GWX k Y]n'YfghfYW\_h'g]WX'ØVYf'Y]bY': `ÀWXY'j cb '\*"\$\$\$'<Y\_hUf'i bX'VY\YfVYf[h'Y]bY'Y]bn][Ufh][Y'H]Yf!'i bX DZUbnYbk Y`h"'6Ygi WXYf'\_ÒbbYb'Ui Z'[i h'Ui g[YgWX]`XYfhYb K UbXYfk Y[Yb'X]Y'i bVYfØ\fhY'BUhi f'XYg'BUh]cbU`dUf\_g Yf\_i bXYb'i bX'gY`hYbY'5fhYb'k]Y'XYb'l \i 'cXYf'XYb K UbXYfZU`\_Yb'VYcVUWX hYb"
- N]hhUi Yf; YV]f[Y. 8 Ug N]hhUi Yf; YV]f[Y ]ghY]b; Y\Y]a h]dd ZØf B Uhi f`]YV\UVYfžX]Y X]Y VYY]bXfi W\_YbXY 6Yf[k Y`h'UVgY]hg XYf hci f]gh]gWXYb A UggYb YbhXYW\_Yb a ÒWXhYb A ]h'k ]`Xfca Ubh]gWXYb HÀ`Yfbž'\_`UfYb 6Yf[VÀWXYb i bX a ]hhY`U`hYf`]WXYb GhÀXhWXYb V]YhYh'X]Y FY[]cb Y]bY ]Xm``]gWXY?i `]ggY ZØf Ui g[YXY\bhY K UbXYfi b[Yb i bX YbhqdUbbhY HU[Y ]b XYf B Uhi f"
- 9`VgUbXghY]b[YV]f[Y.'8Ug'9`VgUbXghY]b[YV]f[Y']gh'a]h gY]bYb'V]nUffYb': Y`gZcfaUh]cbYb'i bX'h]YZYb'GWX`i WX hYb Y]bY'XYf'gdY\_hU\_i `AfghYb'BUhi f`UbXgWXUZhYb 8Yi hgWX`UbXg"'8Yf'VYfØ\a hY'AU`YfkY['ZØ\fh'Xi fWX'X]YgY Y]bn][Ufh][Y'@UbXgWXUZh'i bX'V]YhYh'K UbXYfYfb UhYa VYfUi VYbXY'5i gV`]W\_Y'i bX'i bj Yf[Ygg`]WXY BUhi fYf`YVb]ggY"

A ]hˈgY]bYfˈj ]Y`ZÀ`h][ Yb B Uhi fʻV]YhYhʻGUW gYb Y]bY : Ø``Y 'Ub
9f\c`i b[ gcfhYb i bX GY\Ybgk ØfX][ \_Y]hYb ZØf B Uhi f`]YV\UVYf i bX
Ci hXccf!9bh\i g]UghYb" J cb 'XYb ]a dcgUbhYb 'GUbXghY]b ZY`gYb 'XYf
GÀW g]gW Yb 'GW k Y]n 'V]gʻni 'XYb a U`Yf]gW Yb 'HÀ`Yfb 'XYgʻN]hhUi Yf
; YV]f[ Ygʻ[ ]VhʻYgʻ]b 'GUW gYb 'j ]Y`ni 'YbhXYW\_Yb 'i bX 'ni 'Yf`YVYb"
8 ]YgY 'j YfVcf[ YbYb 'C UgYb 'g]bX 'Y]b 'UVgc`i hYgʻA i ggʻZØf 'U``Yž'X]Y
X]Y 'i bVYfØ\fhY 'B Uhi fʻi bX 'X]Y 'j ]Y`ZÀ`h][ Y @UbXgW UZhʻGUW gYbg
Yf\_i bXYb 'a ÒW hYb"

### ?i`]bUf]gW\Y'; YbØggY.'; Ughfcbca ]gW\Y 9bhXYW\_i b[Yb'Ui Z'XYa 'HU[YgUi gZ'i [']b GUW\qYb

6Y] Y]bYa 'HU[YgUi gZi ['bUWX'GUWX gYb'[]Vh'Yg'Y]bY'J]Y`nU\` \_i`]bUf]gWXYf'; YbØggYž'X]Y'6Ygi WXYf'i bVYX]b[h'dfcV]YfYb gc``hYb"'8]Y'gÀWXg]gWXY'?ØWXY'V]YhYh'Y]bY'J]Y`nU\`'j cbhfUX]h]cbY``Yb'; Yf]WXhYb'i bX'8Y`]\_UhYggYbž'X]Y'X]Y'fY[]cbU`Yb; YgWXa ÀW\_Yf'i bX'\_i`]bUf]gWXYb'HfUX]h]cbYb'k ]XYfgd]Y[Y`b"

 $9]bYg`XYf`VY\_UbbhYghYb`; Yf]WhYž`XUg`a Ub`]b`GUWkgYb`i bVYX]b[h$ 

\_cghYb'gc``hYž']gh'XYf'GÀW\g]gW\Y'GUi YfVfUhYb"'8]YgYg'\Yfn\UZhY; Yf]W\h'k]fX'Ui g'a Uf]b]YfhYa ': `Y]gW\ni VYfY]hYhž'XUg'`Ub[gUa[YgW\a cfh'i bX'a]h'Y]bYf'kØfn][Yb'Gc»Y'gYfj]Yfh'k]fX"'8YfGUi YfVfUhYb'k]fX'cZh'a]h'?`Ò»Yb'cXYf'?UfhcZZY`b'gck]Y'a]hFch\_fUi h'gYfj]Yfhž'kUg'Y]bY'\_Ògh`]W\Y'i bX'\Yfn\UZhY'AU\`nY]hYf[]Vh"

9]bY'k Y]hYfY'\_i`]bUf]gW\Y'GdYn]U`]hÀh'GUW\gYbg']gh'XYf'8fYgXbYfGhc``Yb"8]YgYg'hfUX]h]cbY``Y'K Y]\bUW\hg[YVÀW\_'\Uh'Y]bY'`Ub[Y; YgW\]W\hY'i bX'k]fX']b'j]Y`Yb'6ÀW\_YfY]Yb'i bX'?cbX]hcfY]Yb']b GUW\gYb'\Yf[YghY``h"8Yf'Ghc``Yb']gh'Y]b'Zfi W\h][Yf'i bX'bi gg][Yf?i W\Ybž'XYf'cZh'a]h'Di XYfni W\_Yf'VYghÀi Vh'k]fX'i bX'Y]b'UVgc`i hYg Ai gg'ZØf'BUgW\\_UhnYb']gh"

 $: \emptyset f @] YV \setminus UVYf 'j \ cb 'g Ø \rangle Yb '@ Y W_Y f Y] Yb 'V ] Yh Yh 'G UW g Yb 'Ui W 'Y] b Y J ] Y `n U \setminus `'j \ cb '_Ogh`] W Yb '? \ cb X] hc f Y] Yb 'i b X '7 UZÅ g Z X] Y 'Y] b Y 'V f Y] h Y 5 i g k U \ ``Ub 'Hc f h Y b Z '? i W Yb 'i b X '; YV À W_ 'Ub V] Yh Yb '' 6 Y g cb X Y f g V Y`] Y Vh '] g h X] Y '9] Y f g W Y W_Y Z Y] b Y 'h f U X] h] c b Y ``Y 'g À W g] g W Y G d Y n] U`] h A h Z X] Y 'Ui g 'Y] b Y f A ] g W i b [ 'j c b E i Uf_Z'; f] Y \ 'i b X '9] Y f b \ Y f [ Y g h Y ``h 'k ] f X " 8 ] Y g Y '`Y W_Y f Y 'i b X 'W f Y a ] [ Y 'G Ø \ g d Y ] g Y '] g h Y] b k U \ f Y f ; Y b i g g 'Z Ø f 'U``Y Z X] Y '[ Y f b Y 'G Ø \ Y g 'Y g g Y b "$ 

BYVYb'XYb'hfUX]h]cbY``Yb'gÀWXg]gWXYb'GdY]gYb'V]YhYb'X]Y'GhÀXhY i bX'8 OfZYf'GUWXgYbg'Ui WX'Y]bY'J]Y`nU\``j cb'F YghUi fUbhg'i bX; UghghÀhhYbž'X]Y']bhYfbUh]cbU`Y'?ØWXY'UbV]YhYb"'6Ygi WXYf \_ObbYb'\]Yf'Y]bY'J]Y`nU\``j cb'; Yf]WXhYb'Ui g'U``Yf'K Y`h'dfcV]YfYbž j cb']hU`]Yb]gWXYf'DUghU'ØVYf'a YI ]\_Ub]gWXY'HUWcg'V]g'\]b'ni Ug]Uh]gWXYb'GdYn]U`]hÀhYb"

K YfZYb'k ]f'Y]bYb'6`]W\_'Ui Z'Y]bY'5i gk U\``j cb'gÀWkg]gWkYb 8Y`]\_UhYggYb'i bX'GdYn]U`]hÀhYb']b'XYf'bUWkZc`[ YbXYb'HUVY``Y.

; Ughfcbca ]gWXY 9bhXYW_i b[	6YgWxfY]Vib[
GU`nghUb[Yb	GU`n][ Yg'?bUVVYf[ YVÀW_'Ui g
	GUWXgYbžXUgʻni '6]YfʻcXYfʻK Y]b
	gYfj ]Yfh'k ]fX"
@Y]dn][Yf`@YfW\Y	9]bY`gØ»Y`;YVÀW_gdYn]U`]hÀh
	UigʻA ØfVYhY][žʻ[YZØ``hʻa]h
	A Ufn]dUb i bX A UbXY b"
; fØbY'?`Ò»Y	?`Ò» Y`Ui g`fc\Ybž'[Yf]YVYbYb
	?UfhcZZY`bžX]Y`U`g`6Y]`U[Y`ni
	: `Y]gWX [ Yf]WX hY b
	k YfXYb"

±g[YgUa h`\Uh`GUWXgYb`Y]bY`fY]WXY`\_i`]bUf]gWXY`HfUX]h]cbž'X]Y 6Ygi WXYf'a ]h'Y]bYf'J]Y`nU\``j cb`XY`]\_UhYb'; Yf]WXhYbž'GØ» gdY]gYb i bX`]bhYfbUh]cbU`Yb`? Ògh`]W\\_Y]hYb`j Yfk Ò\bh"`9]b`HU[YgUi gZi [`]bX]YgY`FY[]cb'j Yfgdf]W\h'gca ]h'b]W\h'bi f`\_i `hi fY``Y`i bX`bUhØf`]W\YGW\Òb\Y]hYbž'gcbXYfb`Ui W\`[Ughfcbca ]gW\Y`9f`YVb]ggYž'X]Yi bj Yf[Ygg`]W\`V`Y]VYb"

#### 9bhXYW\_Y`i bX`[Yb]Y»Y`GUWXgYbg jYfVcf[YbY`GWXÀhnY

GUWX gYbg'j YfVcf[YbY'GWX ÀhnY'g]bX'fY]WX'Ub'; YgWX]WX hYž?i `hi fž B Uhi fgWX Ob\Y]hYb'i bX'\_i `]bUf]gWXYb'; YbØggYb"'9]b'HU[YgUi gZi [Xi fWX'X]YgYg'ZUgn]b]YfYbXY'6i bXYg`UbX'V]YhYh'Y]bY'J]Y`nU\`'Ub 9bhXYW\_i b[ga O[`]WX\_Y]hYbžX]Y'Yg'ni 'Yf\_i bXYb'`c\bh"'Jcb'XYb VYY]bXfi W\_YbXYb'\]ghcf]gWXYb'GhAhhYb'V]g'\]b'ni 'XYb a U`Yf]gWXYb'@UbXgWXUZhYbž'j cb'XYb']Xm``]gWXYb'B Uhi fcUgYb'V]g ni 'XYb'\_Ogh`]WXYb'[Ughfcbca]gWXYb'GdYn]U`]hÀhYb''GUWXgYb'\Uh ZØf'YXYb'6Yqi WXYf'Yhk Ug'ni 'V]YhYb"

8]Y'fY]W\Y'JYf[Ub[Yb\Y]h'GUW\gYbg'k]fX'XifW\'gY]bY'; YgW\]W\hY ibX'?i`hifnia @YVYb'YfkYW\_hz'kÀ\fYbX'X]Y'UhYaVYfUiVYbXYBUhif`UbXgW\UZh'XYb']XYU`Yb'FU\aYb'ZØf'YbhgdUbbhY9f\_ibXib[Yb'V]YhYh''8UfØVYf'\]bUig'V]YhYh'X]Y'j]Y`ZÀ`h][Y; Ughfcbca]Y'XYg'@UbXYg'Y]bY': Ø``Y'jcb'\_i`]bUf]gW\Yb'; YbØggYbz'X]Y'X]Y'G]bbY'jYfkÒ\bYb"

9]b 'HU[ YgUi gZi [ 'bUW 'GUW gYb' j Yfgdf]W h'U`gc 'b]W h'bi f'Y]bY FY]gY 'Xi fW 'X]Y 'NY]hž gcbXYfb 'Ui W 'Y]bY FY]gY 'ni 'XYb j YfVcf[ YbYb 'GW ÀhnYb 'X]YgYg 'ZUgn]b]YfYbXYb '6i bXYg`UbXYg" HUi W Yb 'G]Y 'Y]b ']b 'X]Y 'fY]W Y'; YgW ]W hY i bX '? i `hi fž YbhXYW\_Yb G]Y 'X]Y i bVYfØ\fhYb 'BUhi fgW Òb\Y]hYb i bX '[ Yb]Y » Yb 'G]Y 'X]Y j ]Y`ZÀ`h][ Yb '\_i `]bUf]gW Yb'; YbØggY 'GUW gYb'k ]fX 'G]Y 'a ]h G]W Yf\Y]h'VY[ Y]ghYfb"

8 Y hU]`g

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z 'Y]bY!fY]gY "XY