

# A Uhh]'< Yffa Ubb'hf]i a d\]Yfh'VY]'A UghYf! K A .'; c`X'i bX'G]`VYf'ZØf': fUb\_YbVYf[ °

@Y]W\hUh\`Yh'A Uhh]'<Yffa Ubb'[Yk]bbh'VY]'XYf'A UghYf!K A ']b; OhYVcf['; c`X']a 'NY\b\_Ua dZi bX'G]`VYf']a GhUV\cW\gdfi b['ZØf': fUb\_YbVYf["

8]Y'@Y]W\hUh\`Yh]\_!K Y`ha Y]ghYfgW\UZhYb`XYf`A UghYfg`]b; OhYVcf[kifXYb`ZØf`A Uhh]'<Yffa Ubb`ni 'Y]bYa [Ubn`VYgcbXYfYb</li>
<][\`][\h"8Yf`5h\`Yh'j cb`XYf`G; 'J cfk Afhg': fUb\_YbVYf['\_cbbhY [`Y]W\`a Y\fZUW\`Ui Za Yf\_gUa 'a UW\Ybž']bXYa 'Yf'; c`X']a NY\b\_Ua dZ'i bX'G]`VYf`]a 'GhUV\cW\gdfi b['YffUb["'8]Yg']gh'b]W\h bi fY]b'dYfgOb`]W\Yf`Hf]i a d\ž'gcbXYfb'Ui W\'Y]b'VYXYi hYbXYf A ca Ybh'ZØf'X]Y'FY[]cb': fUb\_YbVYf["</li>

6YgcbXYfg'VYa Yf\_Ybgk Yfh']ghžXUgg'< Yffa Ubb'g]W\'b]W\h
i bVYX]b[h']b'XYf'VYghYb'J YfZUggi b['dfÀgYbh]YfhY"'6Y]'gY]bYf
5bfY]gY'ni f'A Y]ghYfgW\UZh'\UhhY'XYf'Gdcfh`Yf'g]W\'Y]bYb': Y\`Yf
[Y`Y]ghYhžXYf']\a'ni bÀW\gh'j ]Y`Y'Gcf[Yb'VYfY]hYh'\Uh"'\=\W'V]b
a ]h'XYa '7Ua dYf']bbYf\U`V'j cb'nk Y]'HU[Yb'\cW\[YZU\fYbž'\ÀhhY
a ]f'UVYf'`]YVYf'XfY]'HU[Y'NY]h'[Ybca a Yb ž'[YghUbX'Yf"'9]b
fUgW\Yf'Hf]d'\_ObbhY'a ]h'GhfYgg'i bX'9fgW\OdZ b['j YfVi bXYb'gY]bž
UVYf'<Yffa Ubb'gW\]Yb'g]W\'gW\bY``k]YXYf'ni 'ZUb[Yb'i bX
Zc\_i gg]YfhY'g]W\'Ui Z'gY]bY'K Yhh\_Àa dZY"

#### K Yhh\_Ua dZXYhU]`g i bX @Y]ghi b[Yb

8 Yf'NY\b\_Ua dZž'VYghY\YbX'Ui g'nY\b'j YfgW\]YXYbYb'8 ]gn]d`]bYbž ghY``h'Y]bY'Ybcfa Y'< YfUi gZcfXYfi b['ZØf'YXYb'5h\`YhYb'XUf" 8 YbbcW\'a Y]ghYfhY'< Yffa Ubb'X]YgY'5bZcfXYfi b[Yb'i bX'g]W\YfhY g]W\'X]Y'; c`Xa YXU]``Y'a ]h'Y]bYf'\YfUi gfU[YbXYb'; YgUa h`Y]ghi b["8 Ugg'Yf'Ui W\']a 'GhUV\cW\gdfi b['Y]bY'G]`VYfa YXU]``Y'a ]h'bUW\

<Ui gY`bY\a Yb`\_cbbhYž'nYi [ h'j cb`gY]bYf`J ]Y`gY]h][ \_Y]h'i bX
gY]bYa `5h\`Yh]\_j Yfa Ò[ Yb"</pre>

 $: \varnothing f'X]Y'Ni gWX Ui Yf'k Uf'Yg'VYY]bXfi W_YbX'ni 'VYcVUWX hYbž'k ]Y < Yffa Ubb'X]Y'hYWX b]gWX Yb' < YfUi gZcfXYfi b[Yb'XYf'8]gn]d`]bYb VYk À`h][hY'i bX'XUVY]'gY]bY'?cb_i ffYbn'\]bhYf'g]WX'`]Y'' 9g']gh Y]b'i bVYgWX fY]V`]WX Yg'; YZ\@\`ž'Ui Z'XYa 'G]Y[YfdcXYgh'ni 'ghY\Yb'' 5```X]Y'\UfhY'5fVY]h'\Uh'g]WX'Ui g[YnU\`h ž'Ài "YfhY'Yf'bUWX'XYa K Yhh_Ua dZ'''Gc`WXY'9fZc`[Y'_\ObbYb'cZh'Y]bY'E i Y``Y'XYf'A ch]j Uh]cb Z\@f'UbXYfY'Gdcfh`Yf'gY]bž'X]Y']\fY'Y][YbYb'@Ui ZVU\bYb'UbghfYVYb''$ 

- ; c`X`]a 'NY\b\_Ua dZ
- G]`VYf`]a 'GhUV\cW\gdfi b[

8]Y J YfUbghU`hi b[ ']b'; OhYVcf[ 'j YfgUa a Y`hY '5h\`YhYb'Ui g'XYf
[ UbnYb'K Y`h'i bX'Vch'Y]bY'D`UhhZcfa 'ZØf'XYb'5i ghUi gW\'j cb
9fZU\fi b[ Yb'i bX'X]Y': OfXYfi b[ 'XYg'A UghYf!Gdcfhg"'< Yffa Ubbg
VYa Yf\_Ybgk YfhY'@Y]ghi b[ Yb'k YfXYb'b]W\h'bi f']b'gY]bYf'< Y]a Uhž
gcbXYfb'Ui W\']bhYfbUh]cbU``[ Yk ØfX][ hž'k Ug'XUg'6Yk i gghgY]b'ZØf
XYb'Gdcfh'i bX'X]Y'6Yk Y[ i b[ ']a 'GYb]cfYbVYfY]W\'ghÀf\_h"

#### ? Øb Zh][ Y `N]Y `Y 'i b X '9b hk ]W\_ `i b [ Y b

8 Yf'G]Y['VY]'XYf'K Y`ha Y]ghYfgW\UZh']gh'Y]b'k ]W\h][Yf'A Uf\_Yf']b < Yffa Ubbg'? Uff]YfYž'UVYf'Yf'\Uh'VYfY]hg'bYi Y'N]Y`Y']bg'J]g]Yf [Ybca a Yb''' 8 Ug'k Uf'Yfgh'XYf'5bZUb['''+W\'a ÒW\hY'a Y]bY @Y]ghi b[Yb'k Y]hYf'j YfVYggYfb'i bX'gc'`Ub[Y'k]Y'a Ò[`]W\'Ui Z X]YgYa 'B]j YUi 'V`Y]VYb ž'Yf\_`Àfh'XYf'Gdcfh`Yf'j c``Yf 9bhgW\`cggYb\Y]h'''9]b'dcg]h]j Yf'5i gV`]W\_'Ui Z'X]Y'\_ca a YbXYb K YhhVYk YfVY']gh'ghYhg'j cb'Bi hnYbž'VYgcbXYfg']b'Y]bYa 'Gdcfhž XYf'cZh'Xi fW\'X]Y'J]Y`ZU`h'Ub'8]gn]d`]bYb'[YdfÀ[h']gh'

8 UfØVYf`\]bUi g`d`Ubh`< Yffa UbbžʻgY]b`K]ggYb`i bX`gY]bY
9fZU\fi b[Yb`Ub`'Øb[YfY`Gdcfh`Yf`kY]hYfni [YVYb"`8]Y
J YfUbhk cfhi b[ž'X]Y`Yf`U`g`YfZc`[fY]W\Yf`5h\`Yh`hfÀ[hž']gh`b]W\h`ni
i bhYfgW\ÀhnYb"`A Ybhcf]b[`i bX`X]Y`: ÒfXYfi b[`'\b[Yf`HU`YbhY`g]bX
YbhgW\Y]XYbX`ZØf`XUg`K UW\ghi a `XYg`Gdcfhg`]b`8Yi hgW\`UbX"

9gʻnY][hˈg]W\ 'Y]ba U``a Y\fž`XUggʻXYfʻ@Y]ghi b[ggdcfhˈb]W\hˈbi fʻa ]h dYfgÒb`]W\Ya '9fZc`[ 'j Yf\_bØdZhˈ]ghž·gcbXYfb 'Ui W\ 'a ]hˈY]bYf
`YVYbX][ Yb'; Ya Y]bgW\UZh'j cb 'Gdcfh`Yfbž'HfU]bYfb 'i bX': Ubg" '8]Y
A Y]ghYfgW\UZhYb 'V]YhYb 'X]Y 'A Ò[ `]W\\_Y]hž'BYhnk Yf\_Y 'ni 'gW\UZZYb
i bX'j cb 'UbXYfYb 'ni '`YfbYbž'k UgʻZØf`X]Y '\_cbh]bi ]Yf`]W\Y
9bhk ]W\_`i b[ ']a 'Gdcfhij cb'[ fc>Yf'6YXYi hi b[ ']gh"

## $9]b^{\cdot}6^{\cdot}]W_{\underline{\phantom{}}}Ui^{\cdot}Z^{\cdot}X]Y^{\cdot}Ni^{\phantom{}}\underline{\phantom{}}i^{\phantom{}}b^{\phantom{}}Zh^{\cdot}XYg^{\cdot}Gdcfhg$

8]Y'ZcfhgWkfY]hYbXY'DfcZYgg]cbU`]g]Yfi b['XYg'@Y]WkhUh\`Yh]\_!
Gdcfhgž']bgVYgcbXYfY']a 'GYb]cfYbVYfY]Wkž'`Àggh'XUfUi Z'\cZZYbž
XUgg'bcWk'j]Y`Y'kY]hYfY'9fZc`[Y'Zc`[Yb'kYfXYb"'<Yffa Ubbg
9fZc`[Y']b'; ÒhYVcf['g]bX'Y]b'NY]WkYb'ZØf'XYb'i b[YVfcWkYbYb;Y]gh'XYg'KYhhVYkYfVg"'@Y]ghi b[ggdcfhž'Y[U`']b'kY`WkYa '5`hYfž
\_Ubb'X]Y'AYbgWkYb'Yfa i h][Ybž'ØVYf']\fY'; fYbnYb
\]bUi gni [Y\Yb'i bX'g]Wk'ghYh]['kY]hYfni Ybhk]W\_Y`b"

9g'V`Y]Vh'gdUbbYbX'ni 'j YfZc`[ Ybž'k ]Y'g]W\ A Uhh]'< Yffa Ubb'i bX UbXYfY'5h\`YhYb']b'XYf'Ni \_i bZh'Ybhk ]W\_Y`b'k YfXYb"'8Yf'K Y[ 'ni k Y]hYfYb'dYfgÒb`]W\ Yb'i bX'gdcfh`]W\ Yb'A Y]`YbghY]bYb']gh Y]b[ Y`Ài hYhž'i bX'Yg'ghY\h'Ui » Yf': fU[ Yž'XUgg'X]Y'6Y[ Y]ghYfi b[ 'ZØf XYb'Gdcfh'Ui W\ 'k Y]hYf\]b'VfYbbYb'k ]fX"

#### K YhhVYk YfVgj Yf`Ui Z'i bX'@Y]ghi b[

A Uhh]'< Yffa Ubbg'K Y['ni f'A YXU]``Y'VY]'XYf'A UghYf!K A 'k Uf
[YdfÀ[h'j cb'< YfUi gZcfXYfi b[Ybž'X]Y'Yf'a]h'VYa Yf\_Ybgk YfhYf
9bhgW\`cggYb\Y]h'a Y]ghYfhY"'=a 'NY\b\_Ua dZ'XYf'Ui g'nY\b
j YfgW\]YXYbYb'8]gn]d`]bYb'VYghY\hž'

Ui »Yf[Yk Ò\b`]W\Y'@Y]ghi b[Ybž'X]Y']\a '`Yhnh`]W\'X]Y'; c`Xa YXU]``Y
Y]bVfUW\hYb"'6YgcbXYfg'\Yfj cfni \YVYb'g]bX'gY]bY'9f[YVb]ggY']a
8]g\_i gk i fZ'i bX']a 'GdYYfk i fZ'k c'Yf'dYfgÒb`]W\Y'6Ygh`Y]ghi b[Yb
Yfn]Y`hY"'=a 'GhUV\cW\gdfi b['\_cbbhY'Yf'YVYbZU``g'ØVYfnYi [Ybž
a i gghY'g]W\'YXcW\'a ]h'G]`VYf'ni Zf]YXYb'[YVYb"

GY]b'HfU]b]b['j cf'XYf'A Y]ghYfgW\UZh'k i fXY'Xi fW\'Y]bY'j YfÀbXYfhY JcfVYfY]hi b[gfci h]bY'VYY]bhfÀW\h][hž'XU'Yf'g]W\'Ui Z[fi bX'gY]bYg 5bfY]gYd`Ubg'k Yb][Yf'FY[YbYfUh]cbgnY]h'[ÒbbhY"'8YbbcW\ \_cbbhY`<Yffa Ubb`nY][Ybž`XUgg`Yf`hfchn`X]YgYf`< $\emptyset$ fXYb`a ]h`XYf ?cb\_i ffYbn`a ]h\U`hYb`\_Ubb"`8]YgY`: À\][\_Y]h`ni f`5bdUggi b[`i bhYf 8fi W\_`]gh`Y]bY`XYf`GhÀf\_Ybž`X]Y`5h\`YhYb`ni a '9fZc`[`Z $\emptyset$ \fYb"

## FY`Yj UbhY'@Y]ghi b[gXUhYb'i bX'GhUh]gh]\_Yb

 $GhUh]gh]\_Yb'ibX'8UhYb'Uig'jYf[Ub[YbYb'KYhhVYkYfVYb'XYfAUghYfg!@Y]WkhUh\'Yh]\_'nY][Ybž'XUgg'XYf'NY\b\_UadZ'Y]b'Ài »YfghkYhhVYkYfVgZÀ\][Yg'9jYbh']gh''@Uih'XYb'<math>\pm$ bZcfaUh]cbYb'XYg8YihgWkYb'@Y]WkhUh\'Yh]\_!JYfVUbXYg'f8@J£'\UVYb'5h\'YhYb']b'XYf5`hYfg\_`UggY'jcb'')!(\$'\\\fYb']a'8ifWkgWkb]hh'Dib\_hnU\'Ybnk]gWkYb'\*\$\$\$'ibX'+\$\$\$'Dib\_hYb'YffY]Wkh''<YffaUbbg'@Y]ghib[žX]Y'XifWk'gY]bY'ZfØ\Y'JYf`Yhnib[gUbZÀ``][\_Y]h'ibX'gY]b'ghUf\_Yg7caYVUW\_'[YdfÀ[h']ghž'dcg]h]cb]Yfh']\b']a'cVYfYb'6YfY]Wk'X]YgYgGdY\_hfiag''

 $= a \cdot GhUV \setminus cW \cdot gdfi \cdot b[ \cdot YffY]W \cdot hY \cdot < Yffa \cdot Ubb \cdot Y]bY \cdot < O \setminus Y \cdot Z \cdot X]Y \cdot ] \setminus a \cdot b]W \cdot hY \cdot b \cdot f \cdot X]Y \cdot G] \cdot VY \cdot f \cdot Yffa \cdot YXU] \cdot YY \cdot Yf \cdot Yffa \cdot YXY \cdot f \cdot Yffb \cdot Ui \cdot W \cdot i \cdot bhY \cdot f \cdot XYb \cdot WY \cdot ghY \cdot b \cdot @Y]ghi \cdot b[ \cdot Yb \cdot XYf \cdot YhnhY \cdot b \cdot J \setminus f \cdot Y \cdot ]b \cdot gY]bYf \cdot 5 \cdot hY \cdot fg_ \cdot UggY \cdot fUb[ ]Yfh'' \cdot 9f \cdot \emptyset VYfhfUZ \cdot ]b \cdot X]YgYa \cdot K \cdot YhhVYk \cdot YfV \cdot a \cdot Y \setminus fYYfY \cdot gY]bYf \cdot 2cb_i \cdot ffYbhY \cdot b \cdot Z \cdot X]Y \cdot ]b \cdot XYf \cdot J \cdot Yf[ \cdot Ub[ \cdot Yb \setminus Y]h \cdot ghAf_YfY \cdot F \cdot Ygi \cdot hUhY \cdot Yfn]Y \cdot h' \setminus UhhY \cdot b \cdot Z'k \cdot Ug \cdot gY]bY \cdot 9][ \cdot Yb \cdot Y]ghi \cdot b[ \cdot VYgcbXYfg \cdot YYa \cdot Yf_Ybgk \cdot Yfh'a \cdot UW \cdot h''$ 

### ; Ygi bX\Y]h'i bX'HfU]b]b[']a 'Gdcfh

9]b YbhgWXY]XYbXYf: U\_hcf'ZØf'A Uhh] < Yffa Ubbg'9fZc`[Y']gh'gY]bY HfU]b]b[gfci h]bYž'X]Y']\b'hfchn'gY]bYg'UbZÀb[`]WXYb'FØW\_gWX`U[g]b'XYf'JYf\_Y\fgUbfY]gY'k Y]hYf\]b'`Y]ghi b[gZÀ\]['\]Y'h"; Ygi bX\Y]h i bX': ]hbYgg'g]bX']b'XYf'@Y]WXhUh\`Yh]\_'j cb'[fÒ» hYf'6YXYi hi b[ž]bgVYgcbXYfY'VY]']bhYbg]j Yb'K YhhVYk YfVYb'k ]Y'XYf'A UghYf!K A'"

8 Yf '9]b Zi gg 'j cb 'Ui gfY]W Yb XYa 'GW `UZž Ui g[Yk c[Yb Yf 9fb À\fi b['i b X'[Yn]Y `hYa 'HfU]b]b['nY][h'g]W 'b]W h'bi f']b 'XYb 9f[YVb]ggYb ž 'gcb XYfb 'Ui W ']b 'XYf ``Ub[Zf]gh][Yb Gdcfh`YfYbhk]W\_`i b["'8 Yf '8 Yi hgW Y'C `ma d]gW Y'GdcfhVi b X fB C G6 Ł 'VYhcbhž 'XUgg '[YfUXY']a 'GYb]cfYb VYfY]W 'Y]b Y'cdh]a U`Y; Ygi b X\Y]hgj Yfgcf[i b['i b X'F Y\UV]`]hUh]cb 'Yb hgW Y]XYb X'g]b Xž

i a 'J Yf`Yhni b[Yb'ni 'j Yfa Y]XYb'i bX'X]Y'gdcfh`]W\Y @Y]ghi b[gZÀ\][\_Y]h'ØVYf'`Àb[YfY'NY]h'ni 'Yf\U`hYb"

8 i fW. 'gY]bY '@Y]ghi b[Yb'i bX'X]Y '5 fhž'k]Y 'Yf'a]h
< YfUi gZcfXYfi b[Yb'i a [Y\hž'gYhnh'A Uhh]' < Yffa Ubb'Y]b 'ghUf\_Yg
NY]W\Yb'ZØf'Ui ZghfYVYbXY'5 h\`YhYbž'X]Y'Ui W\']b'\`O\YfYb
5`hYfg\_`UggYb']\fYb'D`Uhn']a '@Y]ghi b[ggdcfh'VY\Ui dhYb'a OW\hYb"

8 Y hU] `c

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