

## Gc`]b[Yf'=bhY[fUh]cbgfUhgWXYZ'a U\bh'ni f 6YgcbbYb\Y]h'bUWX '5bgWX`U[

BUWX 'XYa '5bgWX`U[ ']b 'Gc`]b[ Yb 'ZcfXYfh'XYf' \DhY[ fUh]cbgfUh! Jcfg]hnYbXY': ]fci n\_\Ug\ 'ni f'6YgcbbYb\Y]h'i bX'[ Y[ Yb V`]bXYb' < Ugg'Ui Z''

5a 'K cW\YbYbXY'YfY][bYhY'g]W\']b'Gc`]b[Yb'Y]b'i bYfk UfhYhYg
8fUa Už'XUg'X]Y'[YgUa hY'GhUXh'YfgW\ØhhYfhY"'I fgdfØb[`]W\'U`g
: Ygh'XYf'; Ya Y]bgW\UZhii bX'XYg'Ni gUa a Yb\U`hg'[Yd`Ubhž'YbXYhY
X]Y'JYfUbghU`hi b[']b'Y]bYf'HfU[ÒX]Y"'8Yf'Jcfg]hnYbXY'XYg
Gc`]b[Yf'Ni k UbXYfYf!'i bX'\DhY[fUh]cbgfUhYgž'<UggUb
: ]fci n\_\Ug\ža Y`XYhY'g]W\'bi b'ni 'K cfh'i bX'Ài »YfhY'g]W\'ni f
U\_hi Y``Yb'G]hi Uh]cb"

: ]fci n\_\Ug\`f]W\hYhY`g]W\`a ]h`Y]bYa `Y]bXf]b[`]W\Yb`5ddY```Ub`X]Y 

2 ZZYbh`]W\\_Y]h`i bX`X]Y`6Øf[Yf'j cb`Gc`]b[Yb"`9f`VYhcbhYž'k]Y 
k ]W\h][ `Yg`gY]ž'g]W\`]b`X]YgYf`gW\k]Yf][Yb`NY]h`b]W\h'j cb`K i h`i bX 
J cfi fhY]`Yb``Y]hYb`ni ``UggYb"

## 5ddY```XYg'=bhY[fUh]cbgfUhgjcfg]hnYbXYb

: ]fci n\_\Ug\ `Yf\_`ÀfhY `[ Y[ YbØVYf`XYf` F\Y]b]gW\Yb`Dcgh .` K Ug U`g`Y]b`: Ygh`XYf`; Ya Y]bgW\UZh`i bX`XYg`Ni gUa a Yb\U`hg`VY[ ]bbYb gc``hYž`]gh`]b`Y]bYf`HfU[ OX]Y`[ YYbXYhž`X]Y`i bg`U``Y`ni h]YZgh YfgW\ØhhYfh"`8 Ug`YfZØ``h`a ]W\`a ]h`h]YZYa `9bhgYhnYb`i bX`[ fc» Yf HfUi Yf" `8]YgY`K cfhY`nY][ Yb`X]Y`h]YZY`6YhfcZZYb\Y]h`i bX`XUg A ]h[ YZØ\``XYg`J cfg]hnYbXYb`ZØf`X]Y`C dZYf`i bX`]\fY`: Ua ]`]Yb"

\YfUi gghY``YbžXUgg`XYf`HÀhYf` k]Y`j cb`j]Y`Yb`VYgWXf]YVYb`cXYf j Yfa i hYh` 'UfUV]gWX!ghÀa a][ 'cXYf`Y]b`=g`Ua]gh`gY]b`gc``hYž`gc `Uggh`i bg`b]WXh`]b`V`]bXYb`<Ugg`[ Y[ YbY]bUbXYf`j YfZU``Yb"

## : f]YX`]WXYg'Ni gUa a Yb`YVYb']b'Gc`]b[Yb

: ]fci n\_\Ug\ `\cV`\Yfj cfž`XUgg`]b`Gc`]b[Yb'j]Y`Y`A YbgWXYb`Ui g XYb`A U[\fYV!GhUUhYb'i bX`XYa `BU\Yb`CghYb`Zf]YX`]WX a ]hY]bUbXYf``YVYb''' HUi gYbXY'j cb`A YbgWXYb'Ui g`XYb`A U[\fYV!GhUUhYb'i bX`XYa `BU\Yb`CghYb``YVYb`Zf]YX`]WX`]b`Gc`]b[Yb'i bXghY\Yb'[YbUi gc`YbhgYhnh'j cf`X]YgYf`HUh'k]Y`G]Y`i bX']WX''5i WX`g]Y\AhhYb`CdZYf`X]YgYg`A ÒfXYfg`gY]b`\_ÒbbYb`cXYf`g]bX`Yg`j]Y``Y]WXhgc[Uf`[Yk cfXYb ž`VYhcbhY`Yf''8]YgYf`GUhn`i bhYfghfY]WXhX]YGc`]XUf]hÀh']bbYf\U`V`XYf`j YfgWX]YXYbYb'; Ya Y]bgWXUZhYb']bGc`]b[Yb'i bX`ghY``h'\_`Ufž`XUgg`; Yk U`h'b]Ya U`g`Y]bY`@Ògi b[`gY]b\_Ubb''

K Y]hYf'ZØ[hY'Yf'\]bni . @UggYb'G]Y'XYb'cXYf'X]Y'HÀhYf'b]W\h
YffY]W\Ybž'k Ug'X]YgY']a 'G]bb'\UVYb.'X]Y'A YbgW\Yb'\]Yf
[Y[YbY]bUbXYf'Ui Zni \YhnYb"'K Ybb'X]YgY'HUh'i bgYfY'; YgY``gW\UZh
Ui gY]bUbXYffY]» hž'\ÀhhYb'g]Y']\f'N]Y`'YffY]W\h' ': ]fci n\_\Ug\g
K cfhY'n]Y`Yb'XUfUi Z'UVž'Gc`]XUf]hÀh'i bX'; Ya Y]bgW\UZhg[YZØ\`'ni
ghÀf\_Ybž'UbghUhh'k Y]hYfYb'GdU`hi b['JcfgW\i V'ni '`Y]ghYb"

8]Y'[YbUiYb'I a ghÀbXY'XYg'5bgW\`U[gž']bgVYgcbXYfY'8YhU]`g
ni a 'HÀhYfž'g]bX'V]g\Yf'bcW\'i b\_`Uf"' \direction XYb'gcn]U`Yb'A YX]Yb'k]fX
YXcW\'VYfY]hg'j]Y`'gdY\_i `]Yfhž'k Ug'ni 'J Yfi bg]W\Yfi b[Yb'i bX
Ÿb[ghYb'ZØ\fYb'\_Ubb"':]fci n\_\Ug\'k Ufbh'XUj cfž'j cfgW\bY``Y
GW\`ØggY'ni 'n]Y\Yb'i bX'ni '[YbYfU`]g]YfYb"'9g'gY]'k]W\h][ž'X]Y
dc`]nY]`]W\Yb'9fa]hh`i b[Yb'UVni k UfhYb'i bX']b'XYf'Nk]gW\YbnY]h
6YgcbbYb\Y]h'ni 'VYk U\fYb"

#### 6YXYi hi b[ XYf K cfhY j cb : ]fci n\_\Ug\

8]Y'5i ggU[Yb'j cb'<UggUb':]fci n\_\Ug\'g]bX']b'X]YgYf
Ub[YgdUbbhYb'G]hi Uh]cb'j cb'[fc»Yf'6YXYi hi b["'9f'UddY``]Yfh
XUfUbž'X]Y'[Ya Y]bgUa Yb'K YfhY'XYf'; YgY``gW\UZh'\cW\ni \U`hYb
i bX'g]W\'b]W\h'j cb'<Ugg'i bX'J cfi fhY]`Yb'`Y]hYb'ni '`UggYb"'\#\Y]bYf

 $NY]h\check{z}']b'XYf'j]Y`Y'AYbgWXYb'jYfibg]WXYfh'g]bX\check{z}'V]YhYb'gY]bY'K cfhYY]bY'BiUbWY'XYf' < c ZZbib['ibX'XYg'NigUaaYb\U`hg''$ 

8]YgY'9fY][b]ggY'j YfXYi h`]W\Ybž'k]Y'nU\`fY]W\'i bX
i bhYfgW\]YX`]W\X]Y'A YbgW\Yb']b'Y]bYf'GhUXh'k]Y'Gc`]b[Yb'gY]b
\_\ObbYbž'X]Y'XYbbcW\'U`g'Y]bY'; Ya Y]bgW\UZh'YI]gh]YfYb'i bX
[Ya Y]bgUa 'Xi fW\'gW\k YfY'NY]hYb'[Y\Yb'a ØggYb'':]fci n\_\Ug\g
5i Zfi Zž'b]W\h']b'V`]bXYb'<Ugg'ni 'j YfZU``Ybž'gdf]W\h'b]W\h'b]W\h'bi f'ZØf
X]Y'U\_hi Y``Y'@U[Y']b'Gc`]b[Ybž'gcbXYfb'\_ObbhY'U`g'6Y]gd]Y``ZØf
j ]Y`Y'; Ya Y]bgW\UZhYb'k Y`hk Y]h'X]YbYb''

## ; YgWX]WXhY`XYf'=bhY[fUh]cb']b'Gc`]b[Yb

8 Yf'Gc`]b[Yf'Ni k UbXYfYf!'i bX'\deltahY[fUh]cbgfUh'gd]Y`h'XUVY]'Y]bY
nYbhfU`Y'Fc``Yž']bXYa 'Yf'X]Y'\deltahYfYggYb'XYf'A][fUbhYb'j Yfhf]hh
i bX'Dfc'Y\_hY'ni f': ÒfXYfi b['XYg']bhYf\_i `hi fY``Yb'5i ghUi gWXg
]b]h]]Yfh"'8]Y'GhUXh'\Uh'nU\`fY]WXY'Dfc[fUa a Y'i bX'\delta]h]Uh]j Yb
[YghUfhYhž'i a 'XUg'A]hY]bUbXYf'j YfgWX]YXYbYf'?i `hi fYb'ni 'ZÒfXYfb
i bX'Jcfi fhY]`Y'UVni VUi Yb"'5i WX'\_i `hi fY``Y'JYfUbghU`hi b[Ybž'k]Y
XUg''À\f`]WXY': Ygh'XYf'?i `hi fYbž'hfU[Yb'XUni 'VY]ž'XYb
]bhYf\_i `hi fY``Yb'8]U`c['ni 'ghÀf\_Yb"

 $9]b \cdot 9]b \cdot V \cdot W_ \cdot b \cdot GhUh]gh]_Yb \cdot i b X \cdot 8 UhYb$ 

@Ui h'XYa 'GhUh]gh]gW\Yb'6i bXYgUa h'`YVYb']b'Gc`]b[Yb'fi bX
%\* \$"\$\$\$'A YbgW\Yb"'9hk U'&- 'DfcnYbh'XUj cb'\UVYb'Y]bYb
A ][fUh]cbg\]bhYf[fi bX"'8]YgY'\c\Y'NU\`gd]Y[Y'h'X]Y'Yh\b]gW\Y
i bX'\_i `hi fY``Y'8]j Yfg]hÀh'XYf'GhUXh'k]XYf"'Gc`]b[Yb']gh'VY\_Ubbh
ZØf']\fY'6Ya Ø\i b[Yb'i a '\delta hY[fUh]cb'i bX'XYb'Zf]YX`]W\Yb
Ni gUa a Yb\U`h']\fYf'6Øf[Yf"'8UhYb'nY][Ybž'XUgg'X]Y
5fVY]hg`cgYbei chY'i bhYf'A][fUbhYb'nk Uf'\Ò\Yf'`]Y[h'U`g']a
XYi hgW\Yb'8i fW\gW\b]hhž'YXcW\'nU\`fY]W\Y'\delta]h]Uh]j Yb'i bX
6]`Xi b[gdfc[fUa a Y'X]YgYb'I bhYfgW\]YX'ghYh]['j Yff]b[Yfb"

8]Y'GWXi `Y'i bX'6]`Xi b[gY]bf]WXhi b[Yb']b'Gc`]b[Yb'\UVYb
i a ZUggYbXY'Dfc[fUa a Y'ni f'\deltahY[fUh]cb'j cb'?]bXYfb'a]h
A][fUh]cbg\]bhYf[fi bX']a d`Ya Ybh]Yfh"'GdfUWXZÒfXYfdfc[fUa a Y
i bX'\_i `hi fY``Y'\delta]h]Uh]j Yb'g]bX'k Y]h'j YfVfY]hYh'i bX'hfU[Yb'ni
Y]bYa 'VYggYfYb'JYfghÀbXb]g'i bX'gcn]U`Yb'Ni gUa a Yb\U`h'VY]"

# K Y]hYfY DYfgdY\_h]j Yb ni ; Yk U`h'i bX Ni gUa a Yb\U`h

Gc`]b[Yf'\delthY[fUh]cbgfUhlJcfg]hnYbXYf'<UggUb:]fci n\_\Ug\'\YVh']bgY]bYb'\ti a Yfi b[Yb'VYgcbXYfg'X]Y'Bchk YbX][\_Y]h\Yfj cfz'Fi \Yni VYk U\fYb'i bX'b]W\h']b'V`]bXY'Jcfj Yfi fhY]`i b[Yb'ni 'j YfZU``Yb"\delta '8 Yi hgW\`UbX'[]Vh'Yg'nU\`fY]W\Y'\]ghcf]gW\Y'6Y]gd]Y`Yz'X]YnY][Ybz'k]Y'k]W\h]['Yg']ghz'VYgcbbYb'Ui Z'; Yk U`hU\_hY'nifYU[]YfYb"'9]b'a Uf\_UbhYg'6Y]gd]Y`\\]YfZØf']ghXYf'6fUbXUbgW\`U[jcb'Gc`]b[Yb']a '\delta\J\f'%--' z'VY]'XYa 'ZØbZ'hØf\_]gW\gh\aa a][Y:fUi Yb'i bX'A \aakled XW\Yb'i a g'@YVYb'\_Ua Yb"'8]Y'FYU\_h]cbYb'Ui ZX]YgYb'5bgW\`U['nY][hYbz'k]Y'ghUf\_Y'Gc`]XUf]h\aakled hgVY\_i bXi b[Ybjch'A YbgW\Yb'j YfgW\]YXYbYf'<Yf\_i bZh'XUni 'VY]hfU[Yb'\_\ObbYbz'Y]b'[Ya Y]bgUa Yg'NY]W\Yb'[Y[Yb'<Ugg'i bX'FUgg]ga i g'ni 'gYhnYb''

: ]fci n\_\Ug\g`5ddY```]gh'VYgcbXYfg'j cf'XYa '< ]bhYf[ fi bX'X]YgYf; YgWk]WkhY'VYXYi hgUa . '@UggYb'G]Y'XYb'cXYf'X]Y'HÀhYf'b]Wkh YffY]WkYbž'k Ug'X]YgY']a 'G]bb'\UVYb.'X]Y'A YbgWkYb'\]Yf [Y[YbY]bUbXYf'Ui Zni \YhnYb" '9]b'Zf]YX`]WkYg'A ]hY]bUbXYf'i bX'Y]b ghUf\_Yg'; Ya Y]bgWkUZhg[YZØ\``g]bX'YggYbn]Y``ž'i a 'XYb'gcn]U`Yb Ni gUa a Yb\U`h']b'Gc`]b[Yb'ni 'VYk U\fYb'i bX'ni 'ghÀf\_Yb"

K Y]hYfY = Zcfa Uh]cbYb Z]bXYb G]Y Ui ZXYb K YVgY]hYb XYf XYghUh]g i bX XYf Y]b]gWXYb Dcgh"

B 5;

8 Y hU] `c

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