

# 5GJ < Ua a 'ghUfhYh'a ]h'Dc\_U`gd]Y`'[ Y[ Yb HJ '9a gXYhhYb']b'X]Y'GU]gcb

5GJ < Ua a !K YghZU`Yb Ya dZÀb[h'Ua 'GUa ghU[ 'XYb 'HJ 9a gXYhhYb']a '8 < 6!Dc\_U`" 5bdZ]ZZ']gh'i a '%- 'l \f']b 'XYf K 9GHDF 9GG'UfYbU"

5a 'GUa ghU[ 'ghY\h'ZØf'XYb'5GJ'< Ua a !K YghZU`Yb'Y]b

VYXYi hYbXYg'< UbXVU``gd]Y``Ubž'XUg'ZØf'X]Y'A UbbgW\UZh'XYb

5i ZhU\_h']b'X]Y'bYi Y'GU]gcb'a Uf\_]YfYb'k]fX"'I a '%- 'I \f'k]fX']b

XYf'K 9GHDF 9GG'UfYbU'XYf'8f]hh'][ ]gh'HJ '9a gXYhhYb'Yfk UfhYh"

I fgdfØb[ `]W\'gc``hY'X]Y'DUfh]Y']b'XYf'< U``Y'XYg'HJ 9'ghUhhZ]bXYbž

YXcW\'k i fXY'XUg'< Y]a fYW\h'Ui Z[ fi bX'j cb

FYbcj ]Yfi b[ gUfVY]hYb'UV[ Y[ YVYb"

± XYb ``YhnhYb `K c W Yb `k i f XY 'j ]Y` ØVYf X]Y `A ch]j Uh]cb `i b X J c f Z f Yi XY `]bb Y f \ U`V `XYg `5 G J ! H Y Ua g `[ Ygd f c W Yb " 8 Y f 'b Yi Y 7 \ Y Z h f U]b Y f `A ] W UY` < Y [ Ya Ubb ž XYf `]b `X]Y g Ya `G ca a Y f 'j ca H i G 9 A `9 gg Y b `n i `XYa `N k Y]h`][ ]gh Y b `[ Y k Y W g Y`h`]gh ž \ Uh`\c\Y 9 f k Uf h i b [ Yb `Ub `X]Y `DUf h]Y `[ Y [ Yb `XYb `H J 9 " K ]f `k c``Yb i b V Y X]b [ h`]b `X]Y `b À W gh Y F i b X Y `X Y g `8 < 6! D c \_U`g `Y]b n]Y \ Y b ž Y f \_`À f h Y `< Y [ Ya Ubb " `9 g `]gh `Y]b `\_`Uf Y g `N]Y`. `A ]h 'j c``Y f `? f U Z h `n i < Ui g Y `Ub h f Y h Y b `i b X `X Y b `5 i Z g h] Y [ `g W U Z Z Y b "

### BYi ni [Ab[YibXJYf`Yhnib[gidXUhYg

 $6 YgcbXYfg']bhYfYggUbh'k]fX'XUg'Gd]Y``XifWX'X]Y'BYini[Åb[Yž'X]Yg]WX'XYa'5GJ'Ub[YgWX`cggYb'\UVYb'''Hca''\lambda \lambda \lambda bgYbž'XYf'jca''JZ@; iaaYfgVUWX'_Uaž'k]fX'bUWX'gY]bYf'FØW__Y\f'jcb'Y]bYf'@Ub[nY]hj'Yf`Yhnib[']a''fYWXhYb'FØW_fUia'Y]bY'k]WXh][Y'Fc``Ygd]Y`Yb'''@YhnhY'KcWXY'Yfn]Y`hY'Yf'VY]a''HYghgd]Y``[Y[Yb'X]Y'<G;BcfX\cfb!@]b[Yb'gY]b'YfghYg'Hcf']a''5GJ!Hf]_ch''' 9g'ZØ\`h'g]WX$ 

[fc»Ufh][ 'Ubž'k]YXYf'Ui Z'XYa : Y`X'ni 'gY]b ž'[ UV'XYf'\c``ÀbX]gWXYBUh]cbU`gd]Y`Yf'ni 'Dfchc\_c``"5i »YfXYa 'ZfYi Yb'g]W\'X]Y': Ubg'Ui ZX]Y'DfYa]YfY'kY]hYfYf'bYi Yf'Gd]Y`Yf'k]Y'\\*\`]i g'AYmYf!G]YVYfh'i bX\\
\LUb' < \Omegah\fz'X]Y'VY]XY']b'XYf'F\OmegaW\_fUi a dcg]h]cb'UbhfYhYb'k YfXYb"

5i ZXYf'UbXYfYb'GY]hY']gh'XYf'HJ'9a gXYhhYb']b'Y]bYf'À\b`]WXYbG]hi Uh]cb"'Hfchn'XYf'HUhgUWXYž'XUgg'g]Y'U`g'\_`UfYf'5i »YbgY]hYf
[Y`hYbž'g]bX'X]Y'Gd]Y'Yf'j cb'HJ 9!7cUWX'@YbbUfh'@]b[YbYf
\cWXach]j]Yfh"'K]f'g]bX'VYfY]hž'Y]bY'Dc\_U`ØVYffUgWXib['nigWXUZZYb ž'gU[hY'@]b[YbYf'j cfUiggWXUiYbX"'BUWXXYa'X]Y
FØW\_Y\f']b'X]Y'&"'<UbXVU``!6i bXYg`][U']b'XYf'`YhnhYb'GU]gcba]gg`Ub[ž'k]``XYf'HJ 9']a'VYj cfghY\YbXYb'8f]hh`][UghUfh'a]h
Y]bYa'dcg]h]jYb'9f`YVb]g']b'<Ua a'VY[]bbYb"'\dot\dot\dot\hf\AiaYb'\YhnhYb
5i Zgh]Y[gfi bXY'gWXY]hYfhYb'g]Y'bi f'\_bUdd'i bX'hf\AiaYb'\KY]hYf\]b

Ni gàhn`]W\ `ni `XYb`<YfUi gZcfXYfi b[Yb`[]Vh`Yg`Ui W\ `Y]bY

J YfV]bXi b[ `nk ]gW\Yb`XYb`VY]XYb`HYUa g"`9]b][Y`Gd]Y`Yf`XYg`HJ

9a gXYhhYb`\UVYb`VYfY]hg`9fZU\fi b[`VY]a `5GJ`[YgUa a Y`h"`8 Uni
[Y\ÒfYb`i bhYf`UbXYfYa `Hcfk Ufh`C`]j Yf`?fYW\Y``i bX`FØW\_fUi a

A Uf]Ub`Cf`ck g\_]"`@Y]XYf`a ØggYb`Ui W\`g]Y`Ui Z'Y]b][Y`JYf`YhnhY
j Yfn]W\hYbž'X]Y`X]Y`A UbbgW\UZh`j cf`Y]bY`ni gÀhn`]W\Y

<YfUi gZcfXYfi b[`ghY``Yb"

## Gd]Y`]bZcg'i bX', VYfhfU[i b[

8]Y '6Y[Y[bib[']b'XYf'K 9GHDF9GG'UfYbU']gh'b]W\h'bif'ZØf'X]YGd]Y`Yfž'gcbXYfb'Ui W\'ZØf'X]Y': Ubg'j cb'[fc»Yf'6YXYi hib["'8Yf9]b`Ugg'ÒZZbYh'VYfY]hg'i a '%+.' \$'I\fž'gcXUgg'X]Y'NigW\UiYf

[Ybi [`NY]h`\UVYbži a `g]W\`Ui Z`XUg`Gd]Y``Y]bni gh]a a Yb"`H]W\_Yhg g]bX`gck c\``cb`]bY`U`g`Ui W\`Ub`XYf`5VYbX\_UggY`Yf\À`h`]W\ž'k Ug Y]bY`[Øbgh][Y`; Y`Y[Yb\Y]h`ZØf`U``Y`<UbXVU``ZUbg`XUfghY``hž`X]Y`XUg GdY\_hU\_Y```]j Y`a ]hYf`YVYb`a ÒW\hYb"

: Øf`X]Y Yb][ Ybž`X]Y b]W\hij cf`C fh`gY]b`\_ObbYbž`[ ]Vh`Yg`X]Y
A O[`]W\\_Y]hž`XUg`Gd]Y```]j Y`VY]a `5bV]YhYf`8 MB`ni 'j YfZc`[ Yb"
5``YfX]b[ g`k ]fX`XUg`9fghfi bXYb!Dc\_U`gd]Y``b]W\h'ZfY]`Ya dZUb[ VUf
gY]bž`k Ug`X]Y`FY`Yj Ubn`XYf`J YfUbghU`hi b[ `k Y]hYf`i bhYfghfY]W\h"
A ]h`U```XYb`Ni gUa a Yb\Ab[ Yb`i bX`9fk Ufhi b[ Ybž`X]Y`X]YgY
6Y[ Y[ bi b[ `a ]h`g]W\`Vf]b[ hž`]gh`X]Y`J cfZfYi XY`Ui Z`XUg`A UhW\`Ua
GUa qhU[ `VY]`Gd]Y`Yfb`i bX`: Ubg`[ `Y]W\Yfa U\\*Yb`gdØfVUf"

#### 9]b dUW\_YbXYf 5i ZhU\_h ni a 'Dc\_U'

 $8 \ Ug' V Y j \ cfghY \setminus Y b X Y' D c_U \ gd] Y \cap k \ ]gWX Y b' 5 GJ' < Ua \ a !K \ Y ghZU \ Y b' i b X' HJ' 9 a gX Y hh Y b' ]gh' a Y \setminus f' U \ g' bi f' X Y f' 6 Y [ ]b b' Y ]b Y f' b Y i Y b GU] gc b''' 9 g' ]gh' Y ]b Y' A O [ `]WX_Y ]h' <math>Z O f' V Y$  ]X Y' HY Ua gž']\ fY' 5 a  $V ]h ]c b Y b' ni 'n Y ] [ Y b' i b X' Ui Z' X Y a 'Gd] Y `ZY `X' i a 'X Y b' 9 ]b ni [ ']b' X] Y' b A WX gh Y F i b X Y' ni '_A a d Z Y b''' 8 ] Y' F c ``Y' X Y f' B Y i ni [ A b [ Y ž' X Y f' I a [ Ub [ 'a ]h J Y f` Y hni b [ Y b' i b X' X] Y' A ch] j Uh ]c b' X Y f' Gd] Y `Y f' k Y f X Y b Y b hg WX Y ] X Y b X' g Y ] b ž' i a ']b' X ] Y g Y f' Ui <math>Z f Y [ Y b X Y b' D c_U `f i b X Y' 9 f Z c `[ ni '\ UV Y b'' 5 b h] n] d] Y f h Y' Gd Ub bi b [ 'i b X' gd c f h`] WX Y f' 9 \ f [ Y ]n' k Y f X Y b X ] Y' K 9 G H D F 9 G G' Uf Y b U' Ua 'G Ua gh U [ UV Y b X' ni a '6 Y V Y b' V f] b [ Y b'' Y b'' Y f' Y b'' Y f'' Y f'$ 

8]Y 'UbghY\YbXY 'DUfh]Y 'nk ]gWXYb 'XYa '5GJ '< Ua a !K YghZU Yb 'i bX XYa 'HJ '9a gXYhhYb 'k ]fX']b 'XYf' < UbXVU ``[ Ya Y]bXY 'a ]h 'GdUbbi b[ Yfk UfhYh" '8]YgYf '5b `Ugg ']gh 'b]WX h 'b i f 'Y]b 'HYgh 'ZØf 'X]Y A UbbgWX UZhYbž 'gcbXYfb 'Ui WX 'Y]bY '; Y `Y [ Yb\Y]hž 'X]Y k ]fhgWX UZh ']WXYb 'F U\a YbVYX]b[ i b[ Yb ']a ' < UbXVU `` ni VY `Yi WX hYb" '8]Y 'J YfY]bY ']b 'XYf 'nk Y]hYb '@[ U 'g]bX 'c Zh 'Ui Z GdcbgcfYb 'i bX 'nU\ `YbXY 'Ni gWX Ui Yf 'Ub[ Yk ]YgYbž 'i a ']\fY Z|bUbn]Y ``Y 'GhUV]`]hÀh 'ni 'q]WX Yfb"

 $8 ]Y `9]b hf]hhgd fY ]gY `ZØf `X Ug `Dc _U `gd]Y ``g]b X `Y]b `k ]Wk h][ Yf `: U_hc f'' G]Y `gd]Y [ Y`b `X]Y `DfY ]gd c`]h]_ `k ]XY fž `X]Y `X]Y `Y YfY]b Y `j YfZc`[ Yb ž i a ]\ fY `5 i g[ UVYb `ni `XY W_Yb `i b X `[ `Y]Wk nY]h][ `X]Y `Ni gWk Ui Yfn U\ `Yb ni `ZÒf XY fb "`9]b `8 i fWk gWk b]hhgd fY ]g `ZØf `Y]b `H]W_Yh `]b `XY f `nk Y]hY b$ 

 $< UbXVU``!6ibXYg`][U``]Y[h'a Y]gh'nk ]gWXYb''\%$'ibX''\%) '9ifcž'YbUWX'Gd]Y`cfh'ibX'5hhfU_h]j]hÀh'XYf'A UbbgWXUZhYb''$ 

## : ]bUbn]Yfi b[ 'i bX'Gdcbgcf]b[ ']a '< UbXVU``

8]Y:]bUbn]Yfi b['XYf'<UbXVU``j YfY]bY'YfZc`[h'ØVYfk]Y[YbX'Xi fW\H]W\_Yhj Yf\_Ài ZYž'A YfW\UbX]g]b[ž'GdcbgcfYb'i bXž'b]W\h'ni j Yf[YggYbž'X]Y', VYfhfU[i b[gfYW\hY''Gdcbgcf]b[']gh'ZØf'j]Y`Y 7`i Vg'j cb'nYbhfU`Yf'6YXYi hi b[ž'XU'Yf'Y]bYb'Yf\YV`]W\Yb'HY]`'XYf 'À\f`]W\Yb'9]bbU\a Yb'Ui ga UW\h'''9]b'VY\_UbbhYg'6Y]gd]Y`']gh'XYf 5GJ'<Ua a!K YghZU`Ybž'XYf'U\_h]j 'DUfhbYfgW\UZhYb'a]h'`c\_U`Yb I bhYfbY\a Yb'Y]b[Y\hž'i a 'X]Y':]bUbn`U[Y'ni 'ghUV]`]g]YfYb'''

## , VYfhfU[ib[ XYg Dc\_U gd]Y g

8]Y`Ni gW\Ui YfnU\`Yb`]b`@]j Ygdcfh!, VYfhfU[i b[Yb`\_ObbYb`XYb 7`i Vg`k Yfhj c``Y`9]bV`]W\_Y`[YVYb`i bX`g]bX`\Ài Z][`Y]b`\bX]\_Uhcf`ZØf XUg`U``[Ya Y]bY`\bhYfYggY`Ub`Y]bYf`VYgh]a a hYb`A UbbgW\UZh`cXYf @][U"`8UXi fW\`\_ObbYb`GdcbgcfYb`ni [`Y]W\`bYi Y`A O[`]W\\_Y]hYb Z]bXYbž`]\fY`A Uf\_Yb`Xi fW\`DUfhbYfgW\UZhYb`cXYf`K YfVi b[`]a FU\a Yb`X]YgYf`, VYfhfU[i b[Yb`ni 'd`Uhn]YfYb"

6Y`]YVhY`< UbXVU``d`ÀhnY`n]Y\hcZha U`g`Ui W\`GdcbgcfYb`Ubž`X]Y g]W\`a ]h`XYb`JYfY]bYb`]XYbh]Z]n]YfYb`i bX`XUa ]h`Y]bY`VfY]hYfY ^2 ZZYbh`]W\\_Y]hgk ]f\_gUa \_Y]h`Yfn]Y`Yb"`8]YgY`GmbYf[]Yb`g]bX YbhgW\Y]XYbX`ZØf`X]Y`I bhYfghØhni b[`XYg`< UbXVU``g`Ui Z j YfgW\]YXYbYb`9VYbYbž'j cb`XYf`6Ug]g`ØVYf`X]Y`nk Y]hY`@][U`V]g \]b`ni f`YfghYb`6i bXYg`][U"

A ]h'XYf'[ Yd`UbhYb'DUfh]Y'nk ]gWXYb'5GJ'< Ua a !K YghZU`Yb'i bX'HJ 9a gXYhhYb'k ]fX'b]WXh'bi f'gdcfh`]WXYf'K Yhh\_Ua dZ'Ui Z'\c\Ya B]j YUi '[ YVchYbž'gcbXYfb'Ui WX'X]Y'A Ò[`]WX\_Y]hž'Y]b'[ fÒ» Yf k YfXYbXYg'Di V`]\_i a 'ZØf'XYb'< UbXVU``gdcfh'ni 'VY[Y]ghYfb'i bX X]Y'Z]bUbn]Y``Y'6Ug]g'XYf'J YfY]bY'ni 'ghÀf\_Yb"

8 Y hU]`q

6 Ygi WX Yb 'G]Y 'i bg 'Ui Z 'b!U[ "XY