

A UggYbgWX `À[YfY]]b '9fZi fh. 'Dc`]nY] gWX `À[h'VY] 'J YfZc`[i b[g'U[X'ni

±bʻ9fZi fh'_Ua ʻYgʻni ʻY]bYfʻa Ugg]j Ybʻ5i gY]bUbXYfgYhni b[ˈa]h 6UW_ghY]bYbʻi bXʻDZYZZYfgdfUm"·Dc`]nY]ʻYfa]hhY`hYʻbUW\ JYfZc`[i b[gʻU[Xii bX: YghbU\a Yb"

D'XYf'9fZ fhYf' DbYbghUXh'_Ua 'Yg'Ua '8]YbghU[UVYbX'ni 'Y]bYa
VYgcf[b]gYffY[YbXYb'JcfZU``ž'U`g'Y]b'GhfY]h'nk]gWXYb'nk Y]
; fi ddYb']b'Y]bY'[Yk U`hhÀh][Y'5i gY]bUbXYfgYhni b['a ØbXYhY"'I a
Yhk U'&\$.&\$'I \f'Yg_U`]YfhYb'X]Y'GdUbbi b[Yb']b'XYf

Hfca a gXcfZZghfU» Y'i bX'XYf'?i fh!GWXi a UWXYf!GhfU» Y''@Ui h
Dc`]nY]Ub[UVYb'k UfYb'V]g'ni '&\$'DYfgcbYb'Ub'XYf

A UggYbgWX'À[YfY]'VYhY]`][hž'X]Y'j cb'Vfi hU`Ya '9]bgUhn'j cb
DZYZZYfgdfUm'i bX'9]gYbghUb[Yb'[YdfÀ[h'k Uf"'8Yf'JcfZU````Àggh
b]WXh'bi f'Ub'XYf'G]WXYf\Y]h']b'XYf'GhUXh'nk Y]ZY`bž'gcbXYfb'k]fZh
Ui WX': fU[Yb'ni f'_cbhfc``]YfhYb'Bi hni b['jcb'; Yk U`h'Ui Z''

A]ggVfUi WX 'gWX k YfYf'; Y[YbghÀbXY'U`g 5b[f]ZZga]hhY`

9]b'VYgcbXYfg'Vfi hU`Yg'8YhU]``kifXY'jcb'5i[YbnYi[Yb'VYf]W\hYh

8]Y'Dc`]nY]'k Uf'gWkbY``'j cf'Cfh'i bX'j YfgWk`cgg'XYb'6YfY]Wk'i a XYb'5b[Yfž'i a 'Gdi fYb'ni 'g]WkYfb'i bX'X]Y'G]hi Uh]cb'i bhYf?cbhfc``Y'ni 'Vf]b[Yb''K À\fYbX'XYf'\Y_h]gWkYb5i gY]bUbXYfgYhni b[Yb'_Ua 'Yg'ni 'Y]bYf'k Y]hYfYb'GWk`À[YfY]'a]hGhUb[Yb'i bX'GhÒW_Ybž'X]Y'Xi fWk'a Y\fYfY'Bchfi ZY'Ui g[Y`Òghki fXY'''8]Yg'i bhYfghfY]Wkh'X]Y'8f]b[`]Wk_Y]h'XYf'G]hi Uh]cb'i bX'X]YBchk YbX][_Y]h'Y]bYg'YbhgWk`cggYbYb'dc`]nY]`]WkYb'9]b[fY]ZYbg"

: YghbU\a Yb i bX ``Ui ZYbXY '9fa]hh`i b[Yb

BUWW XYa 'J cfZU```k i fXYb'XfY]'A ÀbbYf']a '5`hYf'nk]gWWYb'&\$'i bX' %'\J\fYb'j cf`Ài Z]['ZYgh[Ybca a Yb"'8]Y'<]bhYf[fØbXY'XYf ?cbZ]_hY'g]bX'XYfnY]h'bcWW i b_`Ufž'k Ug'X]Y'9fa]hh`i b[Yb'j cf'Y]bY <YfUi gZcfXYfi b['ghY``h"'8]Y'Dc`]nY]'i bhYfgi WWh'i bhYf'UbXYfYa 'X]Y a Ò[`]WWYb'A ch]j Y'i bX'X]Y'8 mbUa]_'XYf'5i gY]bUbXYfgYhni b["8UVY]'k YfXYb'Ui WW'9fa]hh`i b[Yb'k Y[Yb'gWWk YfYb @UbXZf]YXYbgVfi WWg'i bX'[YZÀ\f`]WWYf'? ÒfdYfj Yf`Yhni b['[YZØ\fh"

8]Y'HUhgUW\Yž'XUgg']b'Y]bYf'n]j]`]g]YfhYb'; YgY``gW\UZh'gc`W\Y
5[[fYgg]cbYb'ghUhhZ]bXYbž'k]fZh'6YXYb_Yb'Ui Z'''9g'V`Y]Vh
UVni k UfhYbž'k Y`W\Y'k Y]hYfYb'\Dzcfa Uh]cbYb'X]Y'Dc`]nY]
\YfUi gZ]bXYb'k]fX'i bX'cV'gc`W\Y'JcfZ\``Y'Y]b'Y]ba U`][Yg'9fY][b]g
cXYf'HY]``Y]bYg'VYi bfi \][YbXYb'HfYbXg'g]bX''
G]W\Yf\Y]hgVY\ÒfXYb'i bX'X]Y'; YgY``gW\UZh'U`g'; UbnYg'a ØggYb
g]W\XYf': fU[Y'ghY``Ybž'k]Y'a Ub'gc`W\Yb'HYbXYbnYb
Ybh[Y[Ybk]f_Yb'_Ubb'i bX'k]Y'a Ub'X]Y'ÒZZYbh']W\Y'G]W\Yf\Y]h
[Yk \A\f`Y]ghYb'_Ubb''

9]b 5i Zfi Zini f K UW gUa _Y]h

8]YgY [Yk U`hhÀh][Yb 'J cfZÀ``Y 'g]bX 'Y]b 'K YW_fi Z'ZØf'X]Y; Ya Y]bgW\UZh" K]f 'a ØggYb 'i bg 'VYk i ggh'a UW\Ybž'XUgg'; Yk U`h _Y]bY '@Ògi b[']gh'i bX ']a a Yf 'gW\`]a a Y '? cbgYe i YbnYb 'a]h'g]W\Vf]b[h" '8]Y'; YgW\Y\b]ggY ']b '9fZ fh'g]bX 'U`Ufa]YfYbX 'i bX 'nY][Ybž XUgg 'YXYfnY]h'i bX 'ØVYfU``'Y]bY'; YZU\f``Ui Yfb'_Ubb" GYbg]V]`]g]Yfi b['i bX 'DfÀj Ybh]cbga U» bU\a Yb'_ObbhYb'\]Yf YbhgW\Y]XYbX'gY]bž'i a 'ni _ØbZh][Y'J cfZÀ``Y'ni 'j Yf\]bXYfb"'K]f g]bX'U``Y'HY]`'XYf'@Ògi b[ž'i bX'Yg']gh'Ub'XYf'NY]hž'JYfUbhk cfhi b[ni 'ØVYfbY\a Ybž'i a 'i bgYfY'GhUXh'Y]b'GhØW_g]W\YfYf'ni 'a UW\Yb"

FYU_h]cbYb'XYf'2 ZZYbh`]WX_Y]h'i bX'XYf 6Y\ÒfXYb

8]Y 'A UggYbgW\`À[YfY]']b'9fZi fh'\Uh'b]W\h'bi f']b'XYb'gcn]U`Yb
A YX]Ybž'gcbXYfb'Ui W\']b'XYf'6Yj Ò`_Yfi b['ZØf'[fc\"Y'6Ygcf[b]g
[Ygcf[h"J]Y`Y'6Øf[Yf'Ài\"YfhYb']\fY'Ÿb[ghY'ØVYf'X]Y
ni bY\a YbXY'; Yk U`h']b'ghÀXh]gW\Yb'; YV]YhYb"'6Øf[Yfa Y]ghYf'j cb
9fZi fhž'5bXfYUg'6Ui gYk Y]bž'Yf_`ÀfhYž'XUgg'gc`W\Y'JcfZÀ``Y
]bU_nYdhUVY``gY]Yb'i bX'X]Y'GhUXh'k Y]hYf\]b'U``Yg'XUfUb'gYhnYb
k YfXYž'X]Y'G]W\Yf\Y]h'XYf'6Øf[Yf'ni '[Yk\À\f`Y]ghYb"'

8]Y'Dc`]nY]`\Uh'Ub[Y_ØbX][hž'j YfghÀf_h'DfÀgYbn']b'XYf' \bYbghUXh ni 'nY][Ybž'i a 'Ÿ\b`]W_Y]hYb'gc`W\Yf'JcfZÀ``Y'ni 'j Yf\]bXYfb"'8]Y 5V`Ài ZY'k YfXYb'Ui W\'j cb'XYb'`c_U`Yb'A YX]Yb'j YfZc`[hž'X]Y gck c\``ØVYf'X]Y'HUhYb'U`g'Ui W\'ØVYf'X]Y'bchk YbX][Yb A U» bU\a Yb'ni f'?f]a]bU`]hÀhqVY_Àa dZi b['VYf]W\hYb"

<]bhYf[fi bX ni f ; Yk U h_f]a]bU]hÀh]b 8 Yi hgWX Ub X</pre>

 $\pm 0.12 \text{ YhnhYb.} \pm 0.12 \text{$

Ni gUa a Yb\Ub[a]h'8fc[Yb cXYf'5`_c\c`"

Gc`WXY'5i gY]bUbXYfgYhni b[Yb'g]bX'\Ài Z][XUg'9f[YVb]g'j cbYg_U`]YfYbXYb'?cbZ]_hYb']b'gcn]U`Yb'?cbhYl hYbž'X]Y'XUbb']b; Yk U`h'a ØbXYb"'8]Y'6Y\ÒfXYb'gYhnYb'[Yn]Y`hYDfÀj Ybh]cbga U»bU\a Yb'Y]bž'i a 'gc`WXY'JcfZÀ``Y'ni 'j Yfa Y]XYbž]bgVYgcbXYfY']b'ghÀXh]gWXYb'; YV]YhYbž'X]Y'U`g'F]g]_c[YV]YhY

JcfVYi [YbXY'A U»bU\a Yb'i bX G]WXYf\Y]hgghfUhY[]Yb

9fZ fh`\Uh`]b`XYb``YhnhYb`\J\fYb'j YfgW\]YXYbY`GhfUhY[]Yb'i bX Dfc^Y_hY`ni f'; Yk U`hdfÀj Ybh]cb`Ub[Yghc»Yb"'9]bY`XUj cb'i a ZUggh Dfc[fUa a Yž'X]Y`Ui Z'[Yk U`hZfY]Y`?cbZ`]_h`Ògi b[gZÀ\][_Y]hYb UVn]Y`Ybž']bgVYgcbXYfY`ZØf`* [YbX`]W\Y"'

8 UfØVYf`\]bUi g`UfVY]hYh`X]Y`GhUXh`Yb[`a]h`GW\i`Ybž
Gdcfhj YfY]bYb`i bX`gcn]U`Yb`9]bf]W\hi b[Yb`ni gUa a Ybži a `Y]b
6Yk i gghgY]b`ZØf`X]Y`5i gk]f_i b[Yb`j cb`; Yk U`h`ni `gW\UZZYb`i bX
\$\forall [YbX`]W\Y`j cb`dchYbn]Y```[Yk U`hhÀh][Yb`l a ZY`XYfb
ZYfbni \U`hYb"`Dc`]nY]`]W\Y`: i * ghfY]ZYb`i bX`Gdch_cbhfc``Yb`]b
_f]h]gW\Yb`GhUXhhY]`Yb`gc``Yb`YVYbZU``g`Y]bYb`dfÀj Ybh]j Yb`9ZZY_h
\UVYb"

8]Y'U_hi Y``Y'G]hi Uh]cb'nY][hžk]Y'k]Wkh]['Yg']ghž'X]Y
5bghfYb[ib[Yb']b'XYf'; Yk U`hdfÀj Ybh]cb'ibX'XYf'7caaib]hm!
5fVY]h'ZcfhnigYhnYbžia'Y]bY'g]WkYfY'Ia[YVib['ZØf'U``Y'6Øf[Yfni'gWkUZZYb'ibX'X]Y'kY]hYfY'9g_U`Uh]cb'XYfUfh][Yb'JYf\U`hYbg'nijYf\]bXYfb"

8 Y hU1`a