

9]b'Dc`]nY]_ca a]ggUf'Ui g'<Ua a 'YfnÀ\`h'j cb'gY]bYf @Y]XYbgW\UZh'ZØf'XYb'6Yfi Z'i bX'gY]bYa 'YfZc`[fY]W\Yb DcXWUgh' HUhk cfh "

8]Y: Ugn]bUh]cb:ZØf:Dc`]nY]UfVY]hii bX:?fYUh]j]hÀhi]a
A YX]YbVYfY]WX:j YfV]bXYb: 'Y]b:Ua V]h]cb]YfhYg:N]Y`ž:XUg:HcV]Ug
Gdmfci ž:Y]b:Dc`]nY]cVYf_ca a]ggUf:Ui g:<Ua a ž:a]higY]bYa
DcXWUgh: HUhk cfh:'YfZc`[fY]WX:j Yfk]f_`]WX.hii:8]YgYf:DcXWUgh:V]YhYh
b]WXhibi figdUbbYbXY:9]bV`]W_Y:]b:X]Y:K Y`hiXYf
?f]a]bU`Yfa]hhii b[ž:gcbXYfb:`Y]ghYhiUi WX:Y]bYb:6]`Xi b[gVY]hfU[
ZØf:\DhYfYgq]YfhY:i bX:ni _ØbZh][Y:Dc`]n]ghYb"

9fZc`[fY]WXY'6]`Xib[gd`UhhZcfa 'XifWX _fYUh]jYb'5igXfiW_

GdÀhYghYbgʻgY]hʻXYfʻJYfÒZZYbhʻ]W\ib[ˈgY]bYfʻYfghYbʻ9d]gcXYʻUa '*" ib]ʻ&\$&\$`\Uhˈg]W\: HUhk cfh ini 'Y]bYfʻVYXYi hYbXYbʻD`UhhZcfa Ybhk]W_Yʻh"ʻHcV]UgʻGdmfci 'VYf]W\:hYhʻb]W\:hbi fʻØVYfʻgdY_hU_i `ÀfY JYfVfYW\YbžʻgcbXYfbʻ`Y[h'K YfhʻUi ZʻZ bX]YfhYʻ±bZcfa Uh]cbYbʻØVYf X]Yʻ; fi bX`U[YbʻXYfʻDc`]nY]UfVY]h"i8]YgYfʻ5bgUhnʻ\UhʻXYa 'DcXWUgh nY\bhUi gYbXYʻ<ÒfYfʻY]b[YVfUW\hž'X]Yʻg]W\:ZØfʻXUgʻH\Ya U]bhYfygg]YfYbʻi bXʻj cbʻXYbʻ: UW_Ybbhb]ggYbʻXYgʻYfZU\fYbYb Dc`]n]ghYbʻdfcZ]h]YfYbʻa ÒW\:hYb"i8Yf`DcXWUgh`]gh'a]hh`Yfk Y]`Yʻgc UbYf_UbbhžʻXUggʻY]bnY`bYʻ9d]gcXYbʻgc[Ufʻ]a '5i gV]`Xi b[g_cbhYI h XYgʻ@UbXYgUa hYgʻZØfʻ5i gV]`Xi b[ž:cfhV]`Xi b[ii bX DYfgcbU`Ub[Y`Y[Yb\Y]hYbʻXYfʻDc`]nY]`BFK 'f@5:8Łj Yfk YbXYh k YfXYb"

; Ya Y]bgWX UZh i bX I bhYfghØhni b[j cb

: UWX `Yi hYb

8]Y'Ni gUa a YbUfVY]h'a]h'fYbca a]YfhYb'DYfgÒb`]W_Y]hYbž'k]Y XYf'?f]a]bU`dgmW\c`c[]b'@mX]U'6YbYW_Yž'i bhYfghfY]W\h'X]Y DfcZYgg]cbU`]hÀh'XYg'DcXWUghg"'8]YgY'\DhYfU_h]cbYb'Yfa Ò[`]W\Ybb]W\h'bi f'h]YZYfY'9]bV`]W_Yž'gcbXYfb'a UW\Yb'_ca d`YlY'H\YaYbjYfghÀbX`]W\Yf"'8]YgY'6YfY]W\Yfi b['Ub'K]ggYb'i bX'ZUW\`]W\Yf 9l dYfh]gY'ZÒfXYfh'Y]bY'V]`Ubn]YfhY'5i gY]bUbXYfgYhni b['a]h?f]a]bU`h\YaYb'i bX'gdf]W\h'XUfØVYf'\]bUi g'Ui W\'@U]Yb'Ubž'X]Y\DhYfYggY'Ub'X]YgYb'H\YaYb'\UVYb"

Jcb XYf Dc`]nY] ni f ? fYUh]j]hÀh. 8]Y 9bhghY\i b[XYg DcXWUghg

8]Y = XYY ŽY]bYb Dc XWUghini 'ghUfhYb Ž'_Ua 'Hc V]Ug 'Gdmfci 'bc W k À\fYb X 'gY]bYf '5 i gV] 'Xi b["A]h'Y]bYf 'Zi b X]YfhYb '5 i gV] 'Xi b[\]bhYf 'g]W Ž'Ybhk]W_Y`hY 'Yf XYb 'K i bgW Ž'gY]bY '9fZU\fi b[Yb 'i bX ?Ybbhb]ggY 'XYf 'VfY]hYb '2 ZZYbh`]WX_Y]h'ni [Àb[`]WX 'ni 'a UWX Yb" '8Yf , VYf[Ub['j cb 'Y]bYf '6YUa hYb`Ui ZVU\b'ni f'_fYUh]j Yb'; YghU`hi b[k Uf 'ZØf']\b'bU\h`cgž'XU 'Yf 'gY]bY '@Y]XYbgWX UZh 'ZØf':]`a Y 'i bX A YX]Yb'a]h'XYf 'Dc`]nY]UfVY]h'j Yf_bØdZYb'_cbbhY"

9]b DcXWUgh Ui g XYf Y][YbYb K c\bi b[

 $\label{thm:continuous} HcV] Ug`Gdmfci `dfcXi n]Yfhii bX`gW\bY]XYh`X]Y`9d]gcXYb`gY]bYg \\ DcXWUghg`a Y]gh`]b`gY]bYa `K c\bn]a a Yfg`]b`8cfha i bX"`8]Yg`[]Vh \\]\a`X]Y`: `YI]V]`]hAhž`Ub`gY]bYf`: fY]nY]h`ni `UfVY]hYb`i bX \\ [`Y]W\nY]h][`Y]bY`J`YfV]bXi b[`ni `gY]bYb`; AghYb`\Yfni ghY``Yb"`8Yf Yb[U[]YfhY`Dc`]n]gh`]bj Ygh]Yfh`k OW\Ybh`]W\`a Y\fYfY`Ghi bXYbž`i a YXY`9d]gcXY`ni `dYfZY_h]cb]YfYb`i bX`gY]bY`j]Y`ZA`h][Yb`=\XYYb`ni fYU`]g]YfYb"`Hfchn`XYg`\c\Yb`5i Zk UbXg`V`Y]Vh`XYf`DcXWUgh`ZØf`]\bY]bY`<YfnYbgUb[Y`Y[Yb\Y]h"$

8]Y'Ni_i bZh'XYg'DcXWUghg']gh'[Yg]WXYfh

A]h'bYi Yb'9d]gcXYbžX]Y']b'D`Ubi b['g]bXž'nY][h'Gdmfci ž'XUgg'Yg]\a'Ub'=XYYb'b]W\h'a Ub[Y`h"'6YfY]hg'ZØbZ'GY]hYb'a]h

H\Ya Ybj cfgW\`A[Yb`ghY\Yb`VYfY]hži bX`X]Y`bÀW\ghY`9d]gcXY
j Yfgdf]W\hž`gdUbbYbXY`9]bV`]W_Y`]b`X]Y`; fYbnYb`XYf
?f]a]bU`Yfa]hh`i b['ni 'V]YhYb"'8Ub_'XYf`_cbh]bi]Yf`]W\Yb
I bhYfghØhni b['i bX`5bYf_Ybbi b['gY]bYf`5fVY]h`k]fX` HUhk cfh
b]W\h`bi f`Y]b`ZYghYf`6YghUbXhY]``i bhYf`XYb`Hfi Y!7f]a Y!DcXWUghg
V`Y]VYbž'gcbXYfb`Ui W\`U`g`k Yfhj c``Y`6]`Xi b[gfYggci fWY`ZØf`X]Y
Dc`]nY]!`i bX`?f]a]bc`c[]Y[Ya Y]bgW\UZh`k Y]hYf`k UW\gYb"

Ni gUa a YbZUggYbX``Àggh'g]WX`gU[Ybž'XUgg`HcV]Ug`Gdmfci a]h gY]bYa `DcXWUgh` HUhk cfh `b]WXh'bi f'gY]bY'@Y]XYbgWXUZh'Ui g`YVhž gcbXYfb'Ui WX`Y]bYb'k]WXh][Yb'6Y]hfU['ni f'5i Z_`Àfi b['i bX 6]`Xi b[']b'XYf'; YgY``gWXUZh'`Y]ghYh''GY]b'9b[U[Ya Ybh'nY][hž'k]Y_fYUh]j 'i bX']bZcfa Uh]j 'Dc`]nY]UfVY]h'gY]b'_Ubbž'k Ybb @Y]XYbgWXUZh'i bX'DfcZYqq]cbU`]hÀh'Ui ZY]bUbXYf'hfYZZYb''

B 5;

8 Y hU]`g

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