

F Y [Y`Vfi Wk`]a`8gWki b [Y`WUa d.;]i`]U
G]Y [Y` [Y`h`ni`k`Y]h

;]i`]U`G]Y [Y`gcf [h`]a`8gWki b [Y`WUa d`Z0f`5i ZFY [i b [.
F Y [Y`Vf0WkY`i bX`?cbZ]_hY`a`]h`UbXYfYb`?UbX]XUhYb`dFÅ [Yb
]`fYb`5i ZYbh`U`h"

⇒a`G0XUZf]_U`U`h`g]Wk`]a`F`U`a`Yb`XYf`VY`]YVhYb` : YfbgY`gYbXi b [.
⇒Wk`V]b`Y]b`GhUf` `<c`h`a`]Wk` `]Yf`fUi`g` `Y]b`fY [Y`fYWk`hYf`5i Zfi` \f
i bhYf`XYb`?UbX]XUhYb`Ybhk`]W`_Y`h`8`]Y`8`>i bX`≠Zi`YbWf]b` ;]i`]U
G]Y [Y` `U`h`a`]h`]\fYa` `J`Yf`U`hYb`Z0f`j`]Y`5i ZFY [i b [[Ygcf [h`G]Y
k`Uf`b`UWk` `bi`f`XfY]`HU [Yb`]a`8gWki b [Y`WUa d`VYfY]hg`XUg
; YgdfÅWk`gh`Ya`U`Bi`a`a`Yf`Y]bg`i bX`gcf [hY`Z0f`GdUbbi b [Yb
]bbYf`U`V`XYf` ; fi`ddY"

8]Y`<Ui`dhYfY][b]ggY`XfY`hYb`g]Wk` `i`a`X]Y`A`]ggUWk`hi b [`XYf
ZYgh [Y`Y [hYb`F Y [Y`b`ž`X]Y`Y`XYg`≠U`f`]a`8gWki b [Y`WUa d`Z0f`U`Y`Y
HY]`b`Y`a`Yf` [Y`h`Yb`";]i`]U`ž`X]Y`ZFY[k`]`][`]bg`8gWki b [Y`WUa d
 [Y [Ub [Yb`]ghž`gWk`Y]bh`g]Wk` `b]Wk`h`Ub`X]Y`VYghY`Yb`XYb` `J`cf [UVYb
ni` `U`h`Yb`"Ni`6Y []bb`k`i`f`XY`VYfY]hg`Y]b`UbXYfYf`HY]`b`Y`a`Yfž
8Uj`]X`C`fhY [Už`j`cfnY]h][`Ui`g`XYf`G`ck` ` [Yk`Å`h`ž`k`Y]`Yf`Xi`f`Wk`gY]b
J`Yf`U`hYb`X]Y`UbXYfYb`]ff]h]YfhY`"Bi`b`ghY`h`Ui`Wk` ;]i`]U`]a
A`]hY`di`b`_`h`XYf`?`f]h]_"

F Y [Y`j`Yfghc»`i`bX` `c` `Y`9fk`Ufhi`b [Yb

8Yf`8gWki b [Y`WUa d`!Fi`Z`U`h`ghfYb [Y`F Y [Y`b`ž`X]Y`j`cb`U`Y`b
HY]`b`Y`a`Yfb`fYgdY`_h]Yfh`k`YfXYb`a`0ggYb";]i`]U`G]Y [Y` `U`h`X]Yg
UbgWk`Y]bYbX`][bcf]Yfhi`bX`XUa`]h`b]Wk`h`bi`f`]\fY`Y][YbY`Dcg]h]cb`]b
XYf` ; fi`ddY` [YZÅ`f`XYhž`gcbXYfb`Ui`Wk`XYb`9]bXfi`W`ž`XYb`X]Y
Ni`gWk`Ui`Yf`j`cb`XYf`G`ck` `i`bX`]`fYb`@Y [YbXYb` `UVYb`"≠Y]bYa
_`UfYb`6Y]gd]Y`XYg`F Y [Y`j`Yfghc»`Yg` `U`h`G]Y [Y`GU`n`i`bX` ; Yk`0fnY

]bg'7Ua d' [YgWka i [[Y'hž'k Ug'ni 'gcZcfh][Yb' ?cbgYei YbnYb
Z0\fhY.'8]Y'DfcXi _h]cbg'Y]hi b ['\Uh'\f'X]Y' [YgWka i [[Y'hYb
K UfYb'UV[Ybca a Yb"

8cW'XUg'k Uf'b]W'h'XYf'Y]bn][Y'J'cfZU''";]i']U' [Y'h'gc [Uf'gc'k Y]hž
XUgg'g]Y'\f'Y'N][UfYhhYb'i bhYf'XYb'UbXYfYb'HY]'bY\ a Yfb'j YfhY]'hž
k Ug'YVYbZU'g' [Y [Yb'X]Y'8gW'i b [Y'fY [Y'i b [Yb'j Yfgh0» h'' ÆfY
J YfhY]X][i b [3' ÆW' [Y\Y'a]h'a Y]bYf'Gi W'h'i a ž'k]Y'W'k]' ž
Yf_Àfh'g]Yž'k Ug'X]Y'8]g_i gg]cb'bi f'k Y]hYf'Ub\Y]nh''8Ubb]
60W' bYfž'Y]bY'UbXYfY'?UbX]XUh]bž'Ài » Yfh'g]W'j YfÀf [Yfh'0VYf
;]i']Ug'J Yf\U'hYb.' 9g' [Y'h'b]W'hž'k Ug'g]Y'a UW'h''K]Y'g]Y'Y]bZUW
Ui Zi bgYfY'F Y [Y'gW'Y]» h'' 8]YgY'GdUbbi b [Yb'nY][Ybž'XUgg'XUg
HYUa [YZ0 [Y'j]b'; YZU\ f']gh"

I bhYf'XYb'5i [Yb'XYf'Ni gW'Ui Yf

8]Y'; Ya 0hYf'VYfi \][Yb'g]W'bUW'XYa ' ?cbZ]_h'i a 'X]Y
N][UfYhhYb'bi f'_i fn'';]i']U'G]Y [Y'\Uh]b'Y]bYa 'k Y]hYfYb
F Y [Y'j Yfghc» '6UVmdi XYf' [YhY]'hi bX' [Y\c'ZYbž'Yg'; Ycf []bU': 'Yi f
Ui Zhi hfU [Yb''8]Yg'n]Y\h'k Y]hYfY'?f]h]_j cb'XYb'UbXYfYbž
]bgVYgcbXYfY'j cb'GUfU\ '?bUdd]_ž'bUW'g]W'ž'X]Y'bcW'a U'g'Ui Z
X]Y'VYghY\YbXYb'F Y [Y'b'\]bk Y]gh''8cW'Yg'gW'Y]bž'U'g'k 0fXY
;]i']Ug'Æ bcfUbn' [Y [Yb0VYf'X]YgYb'F Y [Y'b'_Y]bY'; fYbnYb
_YbbYb.' ÆW'V]b'Y]bZUW' [YbYfj h'XUj cbž'XUgg'k Ybb'a Ub'@Yi hY
i a 'Yhk Ug'V]hYh'i bX'XUbb'fYgdY_h'cg'XUa]h'i a [Y [Ub [Yb'k]fX ž
ghY''h'GUfU\]a '9]bnY']bhYfj]Yk '_Uf"

8]YgYf'J Yfghc» '_0bbhY' [fUj]YfYbXY' ?cbgYei YbnYb'Z0f'X]Y
 [YgUa hY'; fi ddY'\UVYbž'XU'X]Y'8gW'i b [Y'WUa d!HY]'bY\ a Yf'j b
Y]bYf'HYUa XmbUa]_UfVY]hYb'a 0ggYb''K Ybb'Y]b'HY]'bY\ a Yf'X]Y
F Y [Y'b'] [bcf]YfYž'_0bbhY'XUg'XYb'F Y]n'XYf'G\ck' i bX'XYb'GdU»
Z0f'U''Y'a]bXYfb''8U'V'Y]Vh'X]Y': fU [Yž'k]Y'X]Y'DfcXi _h]cbg'Y]hi b [
i bX'X]Y'UbXYfYb'?UbX]XUhYb'Ui Z'X]YgYg'J Yf\U'hYb'fYU []YfYb
k YfXYb"

8Yf'6fi W'a]h'XYb'8gW'i b [Y'fY [Y'b

C V'Yg'Z0f';]i']U'G]Y [Y'i bX'; Ycf []bU': 'Yi f'hUhgÅW']W

gWk Yfk]Y[YbXY': c`[Yb`[YVYb`k]fXž]ghi b[Yk]gg"9g]gh`YXcW
_`UfžXUgg`X]Y`GdUbbi b[Yb`XYi hgW`UbXk Y]hZØf`fY]W`]W
8]g_i gg]cbgghcZZ`gcf[Yb"8]Y`FY[]Y`Uh]b`j Yf[Ub[YbYb`GhUZZY`b
ghYhg`XUfUi Z'[YUW hYhž`X]Y`FY[Y`b`Xi fW ni gYhnYb"9g`V`Y]Vh
UVni k UfhYbž`cV`g]Y`X]Yga U`YVYbZU`g`Xi fW [fY]ZYbž`i a`X]Y
=hY[f]h`h`XYg`7Ua dg`ni`VYk U`fYb"

A]h`X]YgYb`9fY][b]ggYb`Uh]g]W` ;]i`]U`G]Y[Y`]bg`NYbhf`i a`Y]bYf`
_cbhfcj YfgYb`8]g_i gg]cb`[YfØW`hž`X]Y`g]W`Yf`bcW`Y]b][Y
K YbXi b[Yb`bY`a Yb`k]fX"8]Y': Ub[Ya`Y]bXY`XYf`8gW`i b[Y`g`ck
]gh`[YgdUbbhž`k]Y`g]W`X]Y`@U[Y`Yb`hk]W`Y`b`k]fX`i bX`cV`X]Y
UbXYfYb`?UbX]XUhYb`XYb`8fi W`_Ui g`U`hYb`_ØbbYb"

8 Ug`8gW`i b[Y`WJa dž`cZZ]n]Y`VY`_Ubbh`U`g` =W`V]b`Y]b`GhUf`' <c`h
a]W`_`Y]f`fUi g` ž]gh`gY]h`gY]bYf`YfghYb`5i gghfU`i b[`]a`_`X`f`&\$\$(
Y]b`ZYghYf`6YghUbXhY]`XYf`XYi hgW`Yb` : YfbgY`_UbXgW`UZh`_`XYg
_`X`f`VY[YVYb`g]W`Dfca]bYb`hY`]b`XYb`Ui ghfU`]gW`Yb`8gW`i b[Y`ž
i a`]b`j YfgW`]YXYbYb`DfØZ] b[Yb`ni`VYghY`Yb`i bX`X]Y`Ni gW`Ui Yf
ni`i bhYf`U`hYb"8UVY]`]gh`b]W`h`bi f`X]Y`_ØdfYf`]W`Y`6Y`Ughi b[`Y]b
nYbhfU`Yg`H`Ya Už`gcbXYfb`Ui W`X]Y`8mbUa]_`nk]gW`Yb`XYb
HY]`bY`a Yfbž`X]Y`]b`GhfYggg]hi Uh]cbYb`cZ`Ui Z`X]Y`DfcVY`[YghY`h
k]fX"

8]Y`j cf]Y[YbXY`G]hi Uh]cb`fi bX`i a` ;]i`]U`G]Y[Y`]`i ghf]Yfh
Y]bXfi W`_gj c`ž`k]Y`FY[Y`j YfghØ»Y`i bX`dYfgØb`]W`Y`?cbZ]_hY
cZha U`g`Y]bYb`VYXYi hYbXYb`9]bZi gg`Ui ZX]Y`[YgUa hY` ; fi ddYb!
8mbUa]_`Ui gØVYb`_ØbbYb"FY[Y`VfØW`Y`g]bX`]b`XYf` ; YgW`]W`hY
XYg`8gW`i b[Y`WJa dg`b]W`h`bYi ž`XYb`bcW`_ZØ`fh`XUg`J Yf`U`hYb
Y]bnY`bYf`?UbX]XUhYb`_`Ai Z][`ni`GdUbbi b[Ybž`X]Y`Y`hnh]W`_Ui W`
XYfYb`7`UbW`b`Ui Z`XYb`H]hY` 8gW`i b[Y`_Øb][`cXYf
8gW`i b[Y`_Øb][]b`VYY]bZi ggYb"

9]bV`]W`_]b`X]Y`FY[Y`b`XYg`8gW`i b[Y`WJa dg

8]Y`FY[Y`b`XYg`8gW`i b[Y`WJa dg`g]bX`_`Uf`XYZ]b]Yfhi bX`k YfXYb
j cb`XYf`DfcXi]_]cb`ghfYb[`ØVYfk UW`h`HY]`bY`a Yf`XØfZYb`_Y]bY
@ | i gUfh]_Y`a]h]bg`7Ua d`Vf]b[Yb`cXYf`X]YgY`i bhYfY]bUbXYf
hY]`Yb"8]YgY`FY[Y`b`g]bX`b]W`h`bi f`XUni`XUž`XYb

K YhhVYk YfVgWUfU_hYf'XYf'G\ck 'Ui ZFYW\hni Yf\U'hYbž'gcbXYfb
Ui Wž'i a 'X]Y' ðhY[f]hÀh'XYg': cfa Uhg'ni 'VYk U\fyb''9]b'J Yfghc»
[Y[Yb'X]YgY'FY[Y'b' _Ubb'ni 'GhfUZYb'ZØ\fybž'X]Y'a Ø['WYfk Y]gY
V]g'ni f'gcZcfh][Yb'8]gei U'Z]_Uh]cb'fY]WYb"

8 Ug'J Yf\U'hYb'j cb';]i 'U'G]Y[Y' _ØbbhY'Ui W'Y]bY'8]g_i gg]cb
ØVYf'XYb'l a [Ub['a]h'FY[Y'j YfghØ» Yb'i bX'X]Y'FYU_h]cbYb'XYf
Ni gWUi Yf'Ubghc» Yb'' ð'XYf'J Yf[Ub[Yb\Y]h'[UV'Yg'À\ b']WY
6Y]gd]Y'Yž'k c'FY[Y'j YfghØ» Y'Xi fW'UbXYfY'Dfca]bYbhY'gck c\`
j cb'Ni gWUi Yfb'U'g'Ui W'j cb'XYf'DfcXi _h]cb'_f]h]gW'VYcVUW'hYh
k i fXYb''9g'nY][h'g]Wž'XUgg'gc`WY'J cfZÀ`Y'cZi'X]Y
Ni gWUi Yf]bhYfU_h]cb'VYY]bZi ggYb'i bX'ni '\Ø\Yfyb
9]bgWU'he i chYb'ZØ\fybž'XU'X]Y'Ni gWUi Yf'X]Y'?cbZ]_hY'i bX
8fUa Yb'j YfZc`[Yb"

6YXYi hi b['XYf'Ni gWUi Yf!8mbUa]_

8]Y'Ni gWUi Yf'gd]Y'Yb'Y]bY'YbhgWY]XYbXY'Fc`Y'j]b'XYf
8gWi b[Y`WUa d!8mbUa]_'' Æfy'Gh]a a Yb'YbhgWY]XYbž'k Yf'ja
7Ua d'j YfV'Y]Vh'cXYf'Ui ggWY]XYhž'i bX'VYY]bZi ggYb'X]Y
Gh]a a i b['i bhYf'XYb'HY]'bY\ a Yfb'Yf\YV`]W''8Yf'l a [Ub['a]h
FY[Y'j YfghØ» Yb'k]fX'j cb'Ni gWUi Yfb'\Ài Z]['X]ZYfybn]Yfh
VYk YfhYh''K À\fybX'Y]b][Y'Yg'U'g'Ui ZFY[YbXYg'8fUa U'VYhfUW'hYbž
gY\Yb'UbXYfY'XUf]b'Y]bY'A]ggUW'hi b['XYf'j cf[Y[YVYbYb'FY[Y'bž
X]Y'X]Y': U]fbYgg'XYg'K YhhVYk YfVg'[YZÀ\fyb' _ØbbhY"

8]Y' ðhYfU_h]cbYbž'X]Y'j]b'XYf'G\ck 'ghUhhZ]bXYbž'g]bX'b]W'h'bi f
k]W'h]['ZØf'XUg'l bhYf\U'hi b[gY'Ya Yb'hž'gcbXYfb'gd]Y[Y'b'Ui W
[YgY`gWUZh']WY'K YfhY'i bX'Bcfa Yb'k]XYf''8]Y'5fh'i bX'K Y]gYž
k]Y'?UbX]XUhYb'Ui ZFY[Y'j YfghØ» Y'fyU[]Yfybž'i bX'X]Y
FYU_h]cbYb'XYf'UbXYfyb'7Ua dVYk c\ bYf' _ØbbYb'U'g
A]_fc_cga cg'ZØf'XUg'J Yf\U'hYb'j]b'XYf'; YgY`gWUZh']bhYfdfyh]Yfh
k YfXYb"

6Ygi W\Yb`G]Y`i bg`Ui Z.`b!U["XY