

< U]U`Ufa `]b `5i ghfU`]Yb. `Gi fZYf`VY]  
5hhUW\_Y`Ua `Bcfh\ `G\cfY`6YUW\ `j Yf`Yhnh

9]b`&' !`Å\`f][ Yf`Gi fZYf`k i fXY`]b`Dcfh`A UW`ei Uf]Yž`5i ghfU`]Ybž  
j cb`Y]bYa `<U]`Ub[ Y[ f]ZZYb`i bX`Yf`]hh`gW\k YfY  
6Y]bj Yf`Yhni b[ Yb"

8 ]Y `VYgcf[ b]gYffY[ YbXY`Ni bU\ a Y `j cb  
< U]Ub[ f]ZZYb`]b `5i ghfU`]Yb

⇒ `Øb[ ghYf`NY]h\ UVYb`< U]UhhUW\_Yb`Ub`XYb`? ØghYb`5i ghfU`]Ybg  
VYgcf[ b]gYffY[ YbXYg`5i ga U» `YffY]W\h`"9]b`gW\k YfYf`J cfZU``  
YfY][ bYhY`g]W\ž`U`g`Y]b`&' !`Å\`f][ Yf`Gi fZYf`Ub`Y]bYa `GhfUbX`bU\Y  
Dcfh`A UW`ei Uf]Yž`Y]bYa `VY`]YVhYb`l f`Ui Vgcfh`Ub`XYf`C gh\_ØghYž`j cb  
Y]bYa `<U]`Ub[ Y[ f]ZZYb`k i fXY`"8]Yg`k Uf`VYfY]hg`X]Y`Xf]hhY  
< U]UhhUW\_Y`]bbYf\U`V`j cb`bi f`nk Y]`K cW\Ybž`k Ug`VY]`j ]Y`Yb  
5bk c\ bYfb`i bX`Gi fZYfb`6Ygcf[ b]g`Ui g`ØghY"

8 ]Y `9fY][ b]ggY`Ua `Bcfh\ `G\cfY`6YUW\

5a `J cfa ]]hU[ ž`bUW\`CfhgnY]hž`UhhUW\_Y]fhY`XYf`F`Ui VZ]gW\`XYb  
↑ b[ Yb`A`Ubb`X]fY`\_hj`cf`XYa `Bcfh\ `G\cfY`6YUW\ž`Yhk U`(\$ \$  
?)`ca`YhYf`b`ØfX`]W\`j cb`GmXbYm`"8Yf`Gi fZYf`Yf`]hh`gW\k YfY  
J Yf`Yhni b[ Yb`Ub`gY]bYa `6Y]bž`X]Y`]b`]b`\_f]h]gW\Ya `Ni ghUbXž  
`YXcW\`b]W\h`YVYbg[ YZÅ\`f`]W\`j Yfk i bXYhYb`"NYi [ Yb`VYf]W\hYhYbž  
XUgg`UbXYfY`Gi fZYf`gcZcfhni f`<`]ZY`Y]Yb`\_cbbhYb`i bX  
j Yfgi W\hYbž`X]Y`K i bXYb`XYg`CdZYfg`V]g`ni a`"9]bhfYZZYb`XYf  
F Yhhi b[ g\_fÅZhY`ni `g]W\Yfb"

F Yhhi b[ ga U» bU\ a Yb`i bX`F YU\_h]cbYb`XYf  
; Ya Y]bgW\ UZh

8]Y'gWk.bY''\YfVY][ Yfi ZYbYb'FYhhi b[ g\_fÅZhYžXUfi bhYf'a Y\fyfy  
?fUb\_Ybk U[ Yb'i bX'Y]b'<i VgWk fUi VYfž'gcf[ hYb'ZØf'X]Y  
i a [ Y\YbXY'a YX]n]b]gWkY'J Yfgcf[ i b[ "'8Yf'5i ghfU']Ub'@]ZY[ i UfX  
GYfj ]W'fB@GŁ'gd fUW' ]b'Y]bYa ' : UWVcc\_!Dcghj cb'Y]bYa  
~gWk k Yfyb'<U]Ub[ f]Z" 'i bX'Yf\_`ÅfhYžXUgg'U`Y'GhfÅbXY' ]b'XYf  
FY[ ]cb'ZØf'a ]bXYghYbg'&( 'Ghi bXYb'[ YgdYffh'V'Y]VYb'gc`Ybž'i a  
k Y]hYfy'F]g]\_Yb'ni 'j Yfa Y]XYb"

## 8]Y'DfÅgYbn'XYg'K Y]» Yb'<U]g

8YVUhYb'ØVYf'<U]Y'g]bX' ]b'XYf'?ØghYb' ]b]Y'5i ghfU']Ybg'b]Wk h'bYi ž  
UVYf'X]Y'G]Wk hi b[ 'Y]bYg'K Y]» Yb'<U]gž'X]Y'Ua '[ 'Y]Wk Yb'A cf[ Yb  
Xi fW'XUg'G\Uf\_Ga Ufh' , VYfk UWk i b[ ggmghYa '[ Ya Y'XYh'k i fXYž  
j YfghÅf\_h'X]Y'Yb[ ghY'XYf'Gi fZYf'i bX'GWk ]a a Yf']b'XYf  
I a [ YVi b[ "'K Y]» Y'<U]Y'nÅ\`Yb'ni 'XYb'[ YZÅ\`f]Wk ghYb  
FUi V]gWk Yb'XYf'K Y'hž'k Ug'X]Y'Gcf[ Yb'ØVYf']\fy'DfÅgYbn']b'XYb  
\Y]a ]gWk Yb'; Yk ÅggYfb'Ub\Y]nh"

## 9]b'U`Ufa ]YfYbXYf'HfYbX

ϕ'XYb''YmhYb'nk Y]K cWk Yb'[ UV'Yg'ni XYa 'nk Y]k Y]hYfy  
<U]Ub[ f]ZZY' ]b'5i ghfU']Ybž'XUfi bhYf'Y]bYb'J cfZU'' ]b'XYf'BÅ\Y'j cb  
DYfh\ž'k c'Y]b'Gi fZYf'YVYbZU`g'[ YV]ggYb'k i fXY"'8]YgY'GYf]Y'j cb  
5b[ f]ZZYb'k ]fZhi: fU[ Yb'ØVYf'X]Y'G]Wk Yf\Y]h' ]b'VY' ]YVhYb  
Gi fZ[ YV]YhYb'Ui Z'K Å\fybX' ]a ''YmhYb'ϕ\`f'VYfy]hg'Y]b'8i hnYbX  
5b[ f]ZZY'fy[ ]ghf]Yfh'k i fXYb' 'Y]b][ Y'XUj cb'ZUhU'' ]gh'X]Y'NU\`XYf  
[ YZÅ\`f]Wk Yb'ϕhYfU\_h]cbYb' ]b'X]YgYa 'ϕ\`f'U`Ufa ]YfYbX  
Ub[ Ygh]Y[ Ybž'Ui W'k Ybb'V]g\Yf'\_Y]bY'HcXYgZÅ`Y'ni 'j YfnY]Wk Yb  
g]bX"

## GWk`i ggZc`[ Yfi b[

8]Y'Øb[ ghYb'J cfZÅ`Y'j YfXYi h']Wk Yb'X]Y'Bchk YbX][ \_Y]h'Y]bYf  
j YfghÅf\_hYb'5i Z\_`Åfi b[ 'ØVYf'<U]Ub[ f]ZZY'i bX'XYb'I a [ Ub[ 'a ]h  
XYf'; YZU\fyb'U[ Y'Yb'h'Ub[ 'XYf'Ui ghfU']gWk Yb'?ØghYb"'9g' ]gh  
YbhgWk Y]XYbX'ZØf'X]Y'G]Wk Yf\Y]h'XYf'6Yj Ò\_Yfi b[ 'i bX'XYf  
Hci f]ghYbž'[ YY][ bYhY'A U» bU\`a Yb'i bX'ϕZcfa Uh]cbYb

VYfY]hni ghY`Ybž'i a 'F]g]\_Yb'ni 'a ]b]a ]YfYb'i bX' [ `Y]W\ nY]h][ `X]Y  
VYgcbXYfY'a Uf]bY'l a [ YVi b[ '5i ghfU`]Ybg'ni 'fYgdY\_h]YfYb"

' B 5;

8YhU]`g

6Ygi W\ Yb 'G]Y 'i bg 'Ui Z. 'X]Y!b UW\ f]W\ hYb "bYh