

GW ]ZZgi bZU``]b`B]YXYfk U``i Z.`A chc fgW ]ZZ  
dfU``h`[ Y[ Yb`5b[ Y`Vcch

GW ]ZZgi bZU``]b`B]YXYfk U``i Z.`A chc fgW ]ZZ`\_c``X]Yfh`a ]h  
5b[ Y`Vcchz`GUW gW UXYbž`UVYf`\_Y]bY`J Yf`YhhYb"  
9fa ]hhi b[ Yb``Ui ZYb"

⊕`K U``i Z`Ua`F`Y]bž`[ UV`Yg`]b`XYf`5VYbXXÅa`a`Yfi`b[`XYg`+`  
GYdhYa`VYf`&\$&(`Y]bYb`GW ]ZZgi bZU``ž`XYf`ZØf`U``Y`6YhY`)]`hYb  
[``]a`dZ]W`Ui`g[ ]b[ ž`UVYf`XYbbcW`:`fU[ Yb`Ui`Zk`]fZh`"I`a``&\$.`&\$`I` \f  
j`Yfgi`W`hY`Y]b`%\$)`A`YhYf`Ub[ Yg`A`chc`fgW ]ZZ`XUg`a`]h`GW`fchh  
VY`UXYb`k`Ufž`Y]bYb`[`YY][`bYhYb`5b`\_Yfd`Uhn`]b`XYf`GhUXh  
B]YXYfk U``i Z`ni`YffY]W`Yb``8`cW`VYfY]hg`VY]a`A`Ub`Öj`f]YfYb`]b`XYf`  
9]bZU`fhni`a`GY[ Y`UZYb`\_Ua`Yg`ni`Y]bYa`i`b[`ØW`]W`Yb  
Ni`gUa`a`Ybghc`»`a`]hY]bYa`Xcfh]`cf`5b`\_Yf``Y[ YbXYb`5b[ Y`Vcch`

K ]Y`[ YbUi`Yg`ni`X]YgYa`J`cfZU``\_Ua`ž]gh`a`ca`YbhUb`bcW`i`b`\_Uf`"  
8`Ug`GW ]ZZ`gW ]Yb`VY]a`8`fY`Yb`XYg`5b`\_Yfg`ni`k`Y]h`]b`X]Y`9]bZU`fh  
Y]b[ YXfi`b[ Yb`ni`gY]bž`k`Ug`XYb`Ni`gUa`a`Ybghc`»`a`]h`XYa  
5b[ Y`Vcch`ni`f`:`c`[ Y`UhhY`";`ØW`]W`Yfk`Y]gY`k`i`fXY`VY]`X]YgYa  
I`b[`ØW`\_b]Ya`UbX`j`Yf`Yhh`"8]Y`GW`ÅXYb`VYgW`fÅb`\_Yb`g]W`Ui`Z  
a`UhYf]Y``Y`K`YfhYž`k`cVY]`X]Y`[ YbUi`Yb`5i`ga`U`»`Y`XYg  
GUW`gW`UXYbg`bcW`b]W`hYfa`]hh`h`k`i`fXYb`"8`Ug`A`chc`fgW ]ZZ`\_Ua  
gW`]Y`»`]W`Xi`fW`Y]bY`:`fi`bXVYfØ`fi`b[`Ub`XYf`Ub[`fYbnYbXYb  
6`cchg`U``Y`ni`a`Gh]`ghUbXž`k`Ug`gY]bY`BUj`][`Uh]cb`VYY]bhf`ÅW`h][`hY`"

⇒a`8`YhU]`.`8`Yf`J`Yf`Ui`Z`XYg`I`bZU``g

B`UW`XYa`J`cfZU``i`bhYfbU`a`X]Y`6YgUhn`i`b[`XYg`A`chc`fgW ]ZZg  
Y][`Ybgh`ÅbX][`Y]bYb`:`fY]ZU`fj`Yfgi`W`ž`XYf`YXcW`YVYbZU``g`c`bY  
bYbbYbgk`YfhY`?`ca`d`]\_Uh]cbYb`j`Yf`]YZ`5`\_hi`Y``g]bX`\_Y]bY  
GW`ÅXYb`Ua`A`chc`fgW ]ZZ`VY`\_Ubbhž`k`Ug`ZØf`X]Y`GW ]ZZgVYhfY]VYf`

Y]b`\_Y]bYf`@]W hV`]W\_gY]b`\_ÖbbhY"8]Y: U\fh`XYg`A chcf]gW ]Zg  
k i fXY`YXcW`Ui Z5bcfXbi b[ `XYg`K UggYfghfU» Yb!`i bX  
GW ]ZZU\fhgUa hg`V]g`ni f?`Äfi b[ `XYg`J cfZU`g`Y]b[ YghY`h"

8]Y`K UggYfgW i hndc`nY]`K ]YgVUXYb`U`h`X]Y`9fa ]h`i b[ Yb  
Ui Z[ Ybca`a Ybž`i a`X]Y`[ YbUi Yb`l a gh`AbXY`XYg`l bZU`g`ni`\_`ÄfYb"  
K Ä`fYbX`XYf`Ui ZYbXYb`9fa ]h`i b[ Yb`V`Y]VYb`i: fU[ Yb`cZZYbž`X]Y  
gck c`Z`f`X]Y`GW ]ZgVYhfY]VYf`U`g`Ui W`Z`f`X]Y`Bi hnYf`XYg  
< UZYbg`j cb`6YXYi hi b[ `g]bX" ðk ]Yk Y]h`G]W`Yf`Y]hgj cf`Y`fi b[ Yb  
Ua`< UZYb`i bX`X]Y`B Uj ][ Uh]cbgf]W`h`b]Yb`ni`XYa`J cfZU`  
VY][ YhfU[ Yb`UVYbž`k ]fX`Y]b`k ]W`h][ Yf`Di b`h`b`XYb  
l bhYfji W`i b[ Yb`gY]b"

l bZ`Ä`Y`k ]Y`X]YgYf`g]bX`b]W`h`bi f`VYXUi Yf`W`ž`g]Y`j YfXYi h]W`Yb  
Ui W`X]Y`< YfUi gZcfXYfi b[ Yb`i bX`dchYbn]Y`Yb`; YZU`fYbž`X]Y`a ]h  
XYf`GW ]ZZU\fhj YfVi bXYb`g]bXž`]bgVYgcbXYfY`]b`Yb[ Yb  
< UZYbVYfY]W`Yb"8 U`XYf`GY[ Y`UZYb`j cb`B]YXYfk U`i Z`VYgcbXYfg  
ZfYe i Ybh]Yfh]ghž`k ]fX`XYf: U`g]W`Yf`W`Ui W`]b`Ni`\_i bZh  
6YUW`hi b[ `Z]bXYb"8]Y`K UggYfgW i hndc`nY]`\_ÖbbhY`Yj Ybhi Y`  
Ya dZY`Ybž`ni gÄ`h`]W`Y`G]W`Yf`Y]hga U» bU`a Yb`ni`ØVYfdfØZYbž  
i a`Y]bY`K ]YXYf`c`i b[ `gc`W`Yf`J cfZ`Ä`Y`ni`j Yfa`Y]XYb"

ðg[ YgUa h`V`Y]Vh`UVni k UfhYbž`k ]Y`g]W`X]Y`G]hi Uh]cb  
k Y]hYfYb`hk ]W`Y`h`i bX`k Y`W`Y`@Y`fYb`Ui g`X]YgYa`J cfZU`[ Ync[ Yb  
k YfXYb": Øf`X]Y`6YhfcZZYbYb`]a`GY[ Y`UZYb`i bX`]b`XYf  
GW ]ZZU\fhg[ Ya`Y]bgW`UZh]gh`Yg`j cb`nYbhfU`Yf`6YXYi hi b[ ž`X]Y  
l fgUW`Y`XYg`l bZU`g`ni`Yfa ]hY`bž`i a`Ä`b`]W`Y`Nk ]gW`YbZ`Ä`Y`]b  
XYf`Ni`\_i bZh`ni`j Yf`]bXYfb"

8YhU]`g

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