

## 8 Yf'7ca YVUW\_!?'`Ugg]\_Yf. '7UfX][ Ub g YfcVYfb 'X]Y 'A cXYk Y`h'ni fØW\_

9bhXYW\_Yb`G]Y`XUg'7ca YVUW\_`XYg'7UfX][ Ub g`]b`XYf  
A cXYk Y`h`j ]Y`ZÀ`h][ Y`8Yg][ bgž`Ghm]b[ h]ddg`i bX`X]Y  
GY\bgi W`h`bUW`J ]bhU[ Y"

⊕`XYf`A cXYk Y`h`[ ]Vh`Yg`j ]Y`Y`HY]`Yž`X]Y`i bg`]a a Yf`VY[ `Y]hYbž  
UVYf`]b`XYb`Y`h`hYb`⌘\fYb`U`h`g]W`XYf'7UfX][ Ub`Y`Yf`]a  
<]bhYf[ fi bX`[ Y`U`h`Yb"8]YgY`Ghf]W\_`UW`Yž`X]Y`]b`Y`XYa  
?`Y]XYfgW`fUb`\_]`fYb`D`U`h`Z]bXYhž`k Uf`Ub[ Y`U`g`Y`h`k Ug`U`h`a cX]gW`  
UV[ YghYa dY`h"8cW`[ YbUi`XUg`gW`Y]bh`g]W`ni`AbXYfb"8Yf  
7UfX][ Ub`ZY]Yfh`gY]b`7ca YVUW\_`i bX`k ]fX`]b`X]YgYf`GU]gcb  
i bj Yfn]W`h`Uf`ZØf`Y`XYb`A cXYVYk i gghYb"

⊕a a Yf`a Y`f`8Yg][ bYf`Vf]b[ Yb`XYb`7UfX][ Ub`ni fØW\_`Ui Z`X]Y  
@Ui ZghY[ Y"⊕`XYb`?c`Y`\_h]cbYb`ZØf`<YfVgh`i bX`K ]bhYf`d`f`ÅgYbh]Yfh  
g]W`X]Y`Ghf]W\_`UW`Y`]b`j YfgW`]YXYbghYb`5i gZØ`fi b[ Ybž`j cb  
\_`Ugg]gW`V]g`Yi hfUj U[ Ubh"9]b][ Y`A Uf`Yb`nY][ Yb`A cXY`Y`]b  
@UmYf]b[ !@cc\_gž`k À`fYbX`UbXYfY`a cX]gW`Y`5\_nYbhY`gYhnYbž`i a  
X]YgYb`Y]bgh`U`g` Ub[ YghUi Vh`[ Y`h`YbXYb`?'`Ugg]\_Yf`bYi`ni  
VY`YVYb"

## 8 Ug'7ca YVUW\_`XYg'7UfX][ Ub g

9bhk ]W\_`i b[ Yb`]b`XYf`A cXY`AbXYfb`g]W`fUgW`ž`i bX`k Ufi a`XYf  
7UfX][ Ub`Y`h`h`g`c`d`c`d`i`À`f`]ghž`]gh`Y]b`gdUbbYbXYg`H`Y`a U"~9g`[ ]Vh  
Y]bY`GY\bgi W`h`bUW`XYa`5`h`a cX]gW`Yb"ž`Yf\_`À`fh`B]bU`<Y]bž  
DfcZYggcf]b`ZØf`Ug`]cb`A UbU[ Ya Ybh`]b`6Yf`]b"8]YgY`F`ØW\_`Y`f  
ni`Z`Ø`Y`fYb`Gh`f]W`hi b[ Yb`\_`Ø`b`h`Y`Ui Z`Y]b`U`[ Ya Y]bYg`6YXØfZb]g  
bUW`G]W`Yf`Y]h`j cb`A cXY`ni fØW\_`ni ZØ`fYb`gY]bž`[ `Ui Vh`g]Y"  
J ]bhU[ Y!HfYbXg`gW`Y]bYb`YVYbZU`g`Y]bYb`[ fc»Yb`9]bZi gg`Ui Z`X]Y

U\_hi Y`Yb`?c`Y\_h]cbYb`ni` \UVYb`"

8Yg][ bYf`k ]Y`7\UbY`i bX`F U`d\`@Ui fYb`nY][ Ybž`XUgg`XYf`  
7UfX][ Ub`b]W`h`bi f`Y]bY`dfU\_h]gW`Yž`gcbXYfb`Ui W`Y`bY`gh`j] c`Y`  
K U`l`]gh`"6Y]`7\UbY`Z]bXYb`g]W`a` Y`fZUfV][ Y`Ghf]W`UW`Ybž`X]Y`  
ØVYfY]bUbXYf`[ YhfU[ Yb`k YfXYbž`k A`fYbX`F U`d\`@Ui fYb`Ub[ Y`  
A cXY`Y`a` ]h[ fc» Z`A`W`][ Yb`A`i ghYfb`df`A`gYbh]Yfh`"?Ui a`ni`  
[ `Ui VYbž`XUgg`X]YgYg`Gh`ØW`Y]bgh`U`g`Ub[ k`Y`][ [ `U`h`"

8Yf`7UfX][ Ub`U`h`b]W`h`bi f`Y]bYb`dfU\_h]gW`Yb`Bi`hnYb`VY]`  
k YW`gY`U`ZhYa`K`YhYfž`gcbXYfb`]gh`Ui W`k`]W`h][ `Øf`XYb`  
a`cXYfbYb`@U[ Yb`cc`\_"`9f`\_Ubb`Y]bZUW`ØVYf`Y]bYa`k`Y]hYfYb`  
?`Y]Xi`b[ ggh`ØW`\_ [ YhfU[ Yb`k YfXYb`i bX`VYhc`bh`XUa` ]h`X]Y`  
?fYUh]j ]h`A`h`i b`XYf`A`cXY`"9]b`6Y]gd]Y`Øf`X]YgY`J ]Y`gY]h][ \_Y]h`]gh`Y]b`  
5i`Zhf]h`j`cb`A`U`i`A`UfU`]b`A`U`]UbXž`k`c`Y]b`VfUi`b!gW`k`UfnYg`A`cXY`  
ØVYf`Y]bYa`gW`k`UfnYb`Nk`Y]fY]\Yf`df`A`gYbh]Yfh`k`]fX`"

### ? fYUh]j ]h`A`h`i bX`:` `YI ]V]`]h`A`h`

8]Y`Ghm]b[ !A`Ò[ `]W`\_Y]hYb`Øf`XYb`7UfX][ Ub`g]bX`gW`]Yf`  
i`bVY[ fYb`nh`HfUX]h]cbY`" [ `U`h`XYf`7UfX][ Ub`U`g`Y`Yf`VfUj`ž`UVYf`  
]bnk`]gW`Yb`]gh`U`Y`g`Yf`Ui`Vh`"æbcj`Uh]j`Y`8YhU]`g`k`]Y`6U`cb`A`fa`Y`  
i`bX`C`j`Yfg]nY!GW`b]hY`a`UW`Yb`XUg`C`i`h]h`YVYbX][ Yf`"7Ufc`]bY`  
:]gW`Yfž`Y]bY`Ghm`YW`UW`Ui`g`B`ØfbVYf[ ž`Yf`\_`A`fh`"~: fØ`Yf`k`Uf`XYf`  
7UfX][ Ub`Y`Yf`\_`Ugg]gW`ž`Y`i`hY`\_Ubb`Yf`[ Ub`n`UbXYfg`[ YhfU[ Yb`  
k`YfXYb`" `

8]Y`?ca`V]bUh]cbYb`g]bX`gdUbbYbX.`7UfX][ Ubg`\_`ØbbYb`U`Y]b`U`g`  
Di`"cj`Yf`[ YhfU[ Yb`k YfXYbž`cXYf`a`Ub`\_ca`V]b]Yfh`g]Y`a`]h`Y]bYa`  
HØ`fcW`\_Øf`Y]bYb`VYgcbXYfYb`@cc`\_"Gc[ Uf`U`g`A`]b]\_Y]X`\_Ubb`XUg`  
Ghf]W`gh`ØW`\_ØVYf`XYb`@Ui`ZghY[ ` [ YhfU[ Yb`k YfXYbž`k`Ug`nY][ hž`k`]Y`  
j`]Y`gY]h][ `Yg`]gh`"

: UfVYb`i bX`A`i ghYf`gd]Y`Yb`YVYbZU`g`Y]bY`[ fc» Y`F`c`Y`]b`X]YgYf`  
GU]gcb`"J`cb`g`Ub`ZhYb`HØbYb`V]g`l`]b`ni`"Yi`W`hYbXYbž`Ui`Z`A`" [ Yb`  
: UfVYb`]gh`U`Y`g`XUVY]"`8Yf`HfYbXž`XYb`7UfX][ Ub`]b`j`Uf]]YfYbXYb`  
Gh]Yb`Y]bni`gYhnYbž`gd]Y[ Y`h`g]W`Ui`W`]a`gc[ YbUbbhYb`9WYWh]W`  
; fUbXdU!HfYbX`k`]XYfž`VY]XYa`a`cX]gW`Y`9`Ya`Yb`hY`U`g`

bcghU`[ ]gWXY`<ca a U[ Y`Ub`XYb`Gh]`XYf` ; fc» j ĀhYf`]bhYfdFYh]Yfh  
k YfXYb"

8 Ug`GW`ObY`Ua` 7UfX][ Ub`]ghž`XUgg`Yg`\_Y]bY`ghfYb[ Yb`A cXY!  
FY[ Y`b`[ ]Vhž`Ub`X]Y`a Ub`g]W\`U`hYb`a i gg"K ]Y`7Ufc`]bY` : ]gWXYf  
VYhcbhž`nĀ`h`Yi hY`a Y`f`XYbb`Y`5i h\Ybh]W]hmi` bX`Cf][ ]bU`]hĀh"  
8 Ug`VYXYi hYh`8Yf`7UfX][ Ub`]gh`b]W`h`bi`f`Y]b`Y]bZUWXYf  
?`Y]Xi b[ gghØW`ž`gcbXYfb`Y]b`5i gXfi W`\_j cb`⊗X]j ]Xi U`]hĀh"

## 8 ]Y`K ]YXYfYbhXYW`\_i b[ `Y]bYg`?`Ugg]\_Yfg

⊗`Y]bYf`NY]hž`]b`XYf`g]W`X]Y`A cXY`ghĀbX][ `k UbXY`hž`]gh`XYf  
7UfX][ Ub`Y]b`NY]W`Yb`ZØf`6YghĀbX][ \_Y]hi bX`K UbXY`ni [ `Y]W`"9f  
YfZØ`h`b]W`h`bi`f`X]Y` : i b`\_h]cb`Y]bYg`k Āfa YbXYb`?`Y]Xi b[ gghØW`gž  
gcbXYfb`U`h]g]W`ni`Y]bYa`Gma Vc`ZØf`XYb`a cXYfbYbž`\_fYUh]j Yb  
Gh]`Yb`hk ]W`\_Y`h`K Ybb`G]Y`≠fY` ; UfXYfcVY`UiZdYddYb`a ØW`hYb`ž`]gh  
XYf`7UfX][ Ub`XYf`dYfZY`\_hY`? UbX]XUh`XUZØf` `j ]Y`gY]h][ `i bX`nY]h`c`gž  
UV`Yhnh`k ]YXYf`]b`U`Yf`A i bXY"

## 8 ]Y`6YXYi hi b[ `j cb`BUW\`U`h][ \_Y]h`]b`XYf A cXY

⊗`XYf`\`Yi h][ Yb`A cXYk Y`h`gd]Y`h`BUW\`U`h][ \_Y]h`Y]bY`]a a Yf  
[ fØ» YfY`F c`Y`"8 ]Y`F ØW`\_Y`f`XYg`7UfX][ Ubg`\_ØbbhY`Ui W`]a  
?cbhYi h`XYf`k UW`gYbXYb`BUW`ZFU[ Y`bUW`i a k Y`hžFYi bX`]W`XYf  
6Y`\_Y]Xi b[ [ YgY`Yb`k YfXYb`"J ]Y`Y`8Yg][ bYf`i bX`A Uf`\_Yb  
Zc`\_i gg]YfYb`g]W`XUfUi Zž`\c`Y`E i U`]hĀhgghUbXUfXg`ni`gYhnYb`i bX  
nY]h`c`gY`GhØW`\_Y`ni`gW`UZZYbž`X]Y`ØVYf`gU]gcbU`Y`HfYbXg`\]bUi g  
HfU[ VUf`\_Y]h`V]YhYb`"8Yf`7UfX][ Ubž`a ]h`gY]bYf`Ub[ Yb` ; YgW`]W`hY  
i bX`j ]Y`gY]h][ Yb`J Yfk YbXVUf`\_Y]hž`dUggh]b`X]YgY`D\]`c`g`c`d`Y`"  
A Uf`\_Yb`k ]Y`DUhU[ cb]U`VY`\_YbYb`g]W`\_`Uf`ni`bUW\`U`h][ Yb  
DfU`\_h]\_Yb`"G]Y`j Yfk YbXYb`fYW`hY`A UhYf]U`]Yb`i bX`gYhnYb`Ui Z  
ZU]fY`5fVY]hgVYX]b[ i b[ Yb"

Bi hnYf]bbYb`i bX`Bi hnYf`gi W`Yb`ni bY`a YbX`bUW`?`Y]Xi b[ ž`X]Y  
`Ub[ Y`\Ā`hi bX`b]W`h`gW`bY`Ui g`XYf`A cXY`\_ca a h`7UfX][ Ubg  
YfZØ`Yb`X]YgYg`6YXØfZb]gž`XU`g]Y`gc`j ]Y`gY]h][ `g]bXž`XUgg`g]Y`]b

j YfgWk]YXYbYb'ca V]bUh]cbYb'i bX'GhmYg'[ YhfU[ Yb'k YfXYb  
\_ÒbbYb''8]YgY'@Ub[ `YV][ \_Y]h'hfÀ[ h'XUni `VY]žXYb'Ò\_c`c[ ]gWkYb  
: i »UVXfi W`XYf'A cXY'ni `fYXi n]YfYbž]bXYa `X]Y`Bchk YbX][ \_Y]h  
ZØf`Ài Z][ Y`BYi dfcXi \_h]cbYb'j Yff]b[ Yfh'k ]fX"

: Ug\]cbnk Àb[ Y`i bX`[ YgY`gWk UZh`]Wk Y  
9b hk ]W`i b[ Yb

A cXYhfYbXg'g]bX`cZhiGd]Y[ Y`V]`XYf'[ YgY`gWk UZh`]Wk Yf  
9b hk ]W`i b[ Yb''8Yf'U\_hi Y`Y`HfYbX'ni a `7UfX][ Ub`\_ÒbbhY'a ]h  
j YfgWk]YXYbYb'gcn]U`Yb': U\_hcfYb'ni gUa a Yb`Àb[ Ybž'k ]Y`XYf  
ghY][ YbXYb'5fVY]hj cb'ni `<Ui gY'i bX`XYf': ÒfXYfi b[ 'j cb'?ca Zcfh  
]b`XYf'A cXY''8Yf'K i bgWk`bUWk`6Yei Ya `]Wk\_Y]h`Uhj ]Y`Y`XUni  
VYk c[ Ybž'k Yb][ Yf`Zcfa Y`Y'?`Y]Xi b[ `ni `k À`Ybž'k Ug`XYb  
7UfX][ Ub`U`g'dYfZY\_hY`K U```]b`XYb`A ]hhY`di b\_h'fØW`h"

8 UfØVYf`\]bUi g'nY][ h'g]Wk `Y]b'k UWk gYbXYg' ðhYfYggY`Ub'; YbXYf!  
ðWi g]j ]hm]b`XYf'A cXY''8Yf'7UfX][ Ubž'U`g'[ YgWk`YWk hgbYi hfU`Y  
6Y`\_Y]Xi b[ gc dh]cbž`ZØfXYfh'X]YgY`9b hk ]W`i b[ ``Ghm]b[ gž'X]Y  
j cfa U`g`U`g` ZYa ]b]bY `cXYf' a Ug\_i `]bY `Ub[ YgY`Yb'k i fXYbž  
\_ÒbbYb`YhnhdfcV`Ya `cg`\_ca V]b]Yfh'k YfXYbž'k Ug`X]Y`A cXYgnYbY  
XmbUa ]gWkYf'i bX`]b`i g]j Yf'a UWk h"

9]b`6`]W`\_Ui Z`U\_hi Y`Y`J Yf`\_Ui ZgnU`\`Yb`i bX  
HfYbXg

8]Y`A cXY]bXi ghf]Y`\Uh']b`XYb`YhnhYb`š\`fYb`Y]bY`Ni bU`a Y`]a  
J Yf`\_Ui Z]j cb`6Ug]W?'`Y]Xi b[ gghØW`Yb'j YfnY]Wk bYh''@Ui hY]bYf  
A Uf`hUbU`mgY`j cb`GhUh]ghU`nY][ Yb`YfgWk k ]b[ `]Wk Yž'ei U`]hUhj  
\cWk k Yfh][ Y`Ghf]W`k UfYb`Y]bY`ghUV]`Y`B UWk ZfU[ Y``6YgcbXYfg`]b  
XYb`\_À`hYfYb`A cbUhYb`[ Yk ]bbh`XYf'7UfX][ Ub`Ub`Dcdi `Uf]hÀž'k Ug  
g]Wk ]b`Y]bYa `5bgh]Y[ `XYf`Gi Wk UbZfU[ Yb`i bX`J Yf`\_Ui ZgnU`\`Yb  
k ]XYfgd]Y[ Y`h"

⇒ J Yf[ `Y]Wk`ni `J cf`U`fYb`gh]Y[ `XYf`i a gUhn`]b`XYf'?UhY[ cf]Y  
Ghf]W`k UfYb`i a `Yhk U`%) `i ž'k cVY`]bgVYgcbXYfY`7UfX][ Ubg`U`g  
j ]Y`ZÀ`h][ `Y]bgYhnVUfY`A cXYUfh]\_Y``Yfj c fghUWk Yb''8]Yg`Àggh

XUfUi Z'gW\`]Y» Ybž'XUgg'J YfVfUi WYf'ni bY\ a YbX'VYfY]h'g]bXž']b  
nY]h'cgY'i bX'\_ca V]b]YfVUfY'?'Y]Xi b[ gghØW\_Y'ni `]bj Ygh]YfYb"

8YhU]`g

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