

# >Y Ybh\_ YnÅg A chj 1Wj g`Yj Å



## A chj 1Wj g`Yj Å ! ? YnXÅg

dcfh [ ½

DfYnUXc`GYb\cfz

7 Ufc`GYb\cfz

< j Uu cgz ZÅFZ] VĚa nYtř]ga YfYhYb`bÅj

a U[ nbf

H]grhY hi fUa °

DfYnUXU`GYb\cfUž

7 UfU`GYb\cfUž

< j Uu cgz b ] VĚa nYtř]ga YfYhYb`bÅj

H]grhY h< Õ[ nYa °

DfYnUXcfUĚ`GYb\cffUž

7 UfcfUĚ`GYb\cffUž

< j Uu cgz VĚa nYthbYj Y`Åg`bYa Y`]ga YfYhYb

H]grhY h< Õ[ nYa `i fUa °

DfYnUXcg`GYb\cfYgž

7 Ufcg`GYb\cfYgž

< j Uu cgz h`OW`VĚa nYth

H]grhY h< Õ[ nY]a # fU]a °

5`ei Ya`dcggU]bhYfYggUfž

< j Uu cgz VĚa nYthY`bYj Y`Åg`bYa Y`hY`YgYb`]ga YfYhYb

H]grhY h< Õ[ nY]a # fU]a °

DfYnUXc`Gf`G]j Už

7 Ufc`Gf`G]j Už

< j Uu cgz ZÅFZ] VĚa nYtř]ga YfhibÅj

H]grhY hGa ]h`q]f°

DfYnUXU`Gf`G]j Už

7 UfU`Gf`G]j Už

< j Uu cgz b ] VĚa nYtř\½Už]ga YfhibÅj

H]grhY hGa ]h`bÅ]Ga ]h`5ggncbmı

DfYnUXU`Gf]`G]j Už

7 UfU`Gf]`G]j Už

< j Uu cgz b ] VĚa nYtřY[mYXØ½İž]ga YfhibÅj

H]grhY hGa ]h`5ggncbmı

DfYnUXU`Gf]`G]j Už

7 UfU`Gf]`G]j Už

< j Uu cgz b ] VĚa nYtř]ga YfhibÅj ž]ga YfYhYb`VgU½]½Udch

H]grhY hGa ]h`5ggncbmı

>Y'Ybh\_YnÅg

A chj 1Wj g`Yj Å`



DfYnUXc`J ěřf`G]j Už  
7Ufc`J ěřf`G]j Už

? YXj YgGa ]h `>c\b°

? Yj ÅgVÅ`\\j Uu cgza 1ē fĀ[ YWVĪ HUj Ub`Øn`Yh`\_UdVgc`Uh

9i `[cguf]UXY`WbX]XUUF!a Y`Uc`Wf[c`XY`""ei Y`Zc]  
Ubi bV]UXc`Ya `#bc`#bU`""Ya `""

`GnYfYhbÅ\_`Y`Ybh\_Yrb]`U`""dcrĚ]f UZLa YnĪ\_`U  
""!Vub#Yb`j c`h`\\fXYj Y`U`""bUdcb"

GHubXUF`Zcfa i `UY[mic`mub`1/2`1/2]f UZLa YnbY\_`U`\\fXYhÅgĀhY[ mĪg]Vub`j U[ mia U[ Uh]bVub`1/2`1/2

9gVYj c`Ya `fYgdcg]U`Uc`UbÖbV]c`di V`]WUXc`Ya `#bc`  
#bU`""

5 `""""`\\fXYhYhdcnĚ]f U`gnYfYhbÅ\_`Y`Ybh\_Yrb]`""

GHubXUF`Zcfa i `UY[micb`]bY`\\fXYhYh1/2`1/2]f Uj 1/2]Ugnc`1/2]cf

F YZ]fc!a Y`Uc`gYi `UbÖbV]c`Ya `#bc`#bU`""XUUXc`XY`""

5 `""bUdcb`a Y[ `Y`Ybh`\\fXYhÅgØ`\_Y`\_UdVgc`UhVub`ěřc\_`""

GHubXUF`Zcfa i `U`UbbU\_`Ya U[ nUf]1/2]1/2]UZ`c[m`lc``hU`1/2]hUX`Ua Y[ \\fXYhYh1/2`1/2

9i ``]c`gYi `UbÖbV]c`gcVfY`i a fU`""Yl dYf]YbHY`""  
bcfU`""YX]Āc`XY`""žY`hYb`c [ fUbxY`]bHYfYggY`bU`  
j U`U`

B U[mĀfXY\_` XĀggY`c`j UghUa `U`\\fXYhÅgØ`YhU  
""!Vub#Ybž`c[mY[m]`""gnU`Ya Vfh`\_YfYgbY\_`""

GHubXUF`Zcfa i `UY[mic`mub`1/2`1/2]f U`Y`Ybh\_YnÅg\_cfZLa Y`mYhY[ mia U[ Uh]bVub`j U[ m`\\Yh`\_UdVub`1/2`1/2

J Yb`c`z`dcf`a Y]c`XYg]U`WbX]XUUF!a Y`1/2]dcg]Āc`  
Ubi bV]UXUžVta c`""

GnYfYhbÅ\_`Y`Ybh\_Yrb]`U`a Y[ \\fXYhYhdcnĚ]f U`a ]bh`""

GHubXUF`Zcfa i `U`1/2`1/2]Y`Ybh\_YnÅg\_cf

9i `[cguf]UXY`WbX]HUUF!a Y`Uc`Wf[c`XY`""

GnYfYhbÅ\_`Y`Ybh\_Yrb]`U`""dcrĚ]f U

GHubXUF`Zcfa i `U`1/2`1/2]Y`Ybh\_YnÅg\_cf

5 hi Ua Ybh`fFUU`c`dUFU`""Y`gci `fYgdcbg]1/2]Y`dcf`  
""

>Y`Yb`Y[ `U`""Xc`[ cnca žUa ]`U`\_Q`Yh\_Yn`ZY`Y`ggĀ[ ]  
\_ĀřÖ`Yh]Uf]Ua UmU`""

B m]hĪ `a cbXUh\_Ābh\Ugnb1/2]1/2`U`Y`Yb`Y[ ]`Zc[ `U`\_cn]g] 1/2]Udch`Yě]1/2]U

A chj 1Wj g`Yj Å`!`¥fj YÅg

dcfh [ 1/2

a U[ nUf

9gci `dUfh]W`Ufa YbhY`]bHYfYgg]UXc`bYgY`fFUU`c`  
#Wf[c`z`Vta c`""

? ØÖbÖyb`ĀfXY`Y`Yn`U`a i b\_Uža ]j Y`""

5 bbU\_`Ua Y[ a U[ nUf]1/2]1/2]UZ`c[mia ]ĀfhgnYfYhbÅX`Uh`UXcth`ia i b\_1/2

# A chj 1Wj g`Yj Å

9i [cgUf]U'XY'fUMU\UF'dUFU''''fbcA Y'XU'Ya dfYgUž UZ]a 'XY''''

GnYfYtbÅ\_ 2 bQ\_bY\_ 'Xc' [cnb] 'UhÅfž\c[ m''''

5 bbU\_ 'Ua Y[ a U[ mUf'1/2]g]fUž\c[ mia ]ÅfhgnYfYtbÅX'Uh'UXcthia i b\_1/2

A Yi g'dcbhcg'ZcfHYg'g;c''''

9f ggÅ[ Y]a ''''

5 ``Y[ ZcbhcgUW'h' `UXcbg]1/2 U]X``Yf'1/2U\_cf

9i 'X]f]U'ei Y'U'a ]b\U'Öb]W]ZfUei YnU'Å#Ug'a ]b\Ug Öb]W]gZfUei YnU]g'g;c''''''7 cbi XczYg'ci 'h'bhLbXc a Y\cfUf'bYg'h'f]g'Ug'Ym'cf]g'

; mYb[ YgÅ[ Y]a 'ÖnÅ'fUf'cn]\_ 'hU'1/2ž\c[ m''''''8 Y'YnY\_ Yb\_ U hYfØYhY\_ Yb\_ gnYfYtbÅ\_ 'ZY^ Xb]''

I hU'1/2]U[ mYb[ YgÅ[ Y]XfYžXY'UbbU\_ 'a i hU'1/2]Už\c[ mgnYfYtbÅ\_ 'YnY\_ Yb\_ U hYfØYhY\_ Yb\_ 'ZY^ Xb]

5 WYX]h'c'ei Y'gci ' ]bX]W]Xc'dUFU'c'fUMU\c'dc]g''''

5`\_Ua Ugj U[ nC\_ 'UdcrE]fUž'a ]j Y''''

5 bbU\_ ``Yf'1/2]g]fUž\c[ mia ]h`j U[ m'f' `Y Ybh\_ Yn\_ 'Ua i b\_1/2

9a VcfUYi 'b; c'hYb\UYi dYf]A]W]U'UbhYf]cf'Ya ''''žYi h]j Y''''

< UW'1/2'b]bW]g'\_cf'1/2W] 'hUdUgnU'U'ha\_ U''''žXY'Xc' [cnh] a 1/2''''

5 a ]\_cf'a Å[ 'bYa\_ 'Xc' [cnh]1/2'Uh'UXcthihYfØYhYbžXY'gnYfYtbÅX'WYa i hU'bh]'Ua 1/2]hYfØYhY\_ Yb\_ gnYfnYthi'UdUgnU'U]U]XU

A ]b\U]g'ei U]Z]W]ÅN]g#Vt'a dYh'fU]U]g'dfcZ]gg]cbU]g dUFYWa 'YgUf'XY'U'fXc'Vt'a 'U]g'bYW]gg]XUXYg'XU g' U'Ya dfYgU''

GnU\_ a U]\_ 'ÅdYg'f'ÅgYa #ÅdYggÅ[ Y]a 'a Y[ ZY'YbY\_ 'Uj 1/2U'U' Yj 1/2]g]bU\_''

5 bbU\_ 'U'Yf'1/2]g]fUž\c[ mia ]'mYb\_ 'ÅdYggÅ[ Y\_ 'hYgnbY\_ 'U\_ 'Ua Ugg]1/2]a i b\_1/2

8i fUbh'Ya Yi 'hYa dc'Vt'a c''''žYi 'UdYfZY]ÅcY]# UdfcZ' bXY] #Yg'hYbX] #a Yi 'Vt'b\W]Ya Ybrc'Ya ''''

5a E] '!!!\_ÅbhXc' [cnh]a žZY^ XhYa #\_]V j E]hYhYa\_ U hi X'1/2]ca\_ U''''

9[ mUXcthihYfØYhYb\_ gnYfnYthi'UdUgnU'U'h'VYa i hU'1/2]U'Åg'U\_ 'ÅdYggÅ[ 'Ö^\_ÅdYggÅ[ Y\_ #i X'1/2]gnYfnÅgÅfY

A ]b\U'1/2Y'XY'YgdYW]U]nU'Å;c'Å''''#Gci YgdYW]U]nUXcfU'Ya ''''

GnU\_ hYfØYhYa\_ U''''

5 bbU\_ ``Yf'1/2]g]fUž\c[ mia Yn]\_ 'hYfØYhYb'j UbbU\_ 'U'Y[ bU[ nC'W'YfYXa ÅbmY]Xž'UdUgnU'U]U]X

5 dYgUf'XY'fUMU\UF'Ya #Vt'a ''''ž'fcbY]!a Y Yl'fYa Ua Ybh'Vt'a dYhYbh'Ya ''''

5a E] 'U''''Xc' [cnh]a ž'a U[ U]g]b\_ 'ÅdnYhÅj 1/2]h]a\_ U''''

9[ mUXcthihYfØYhYb\_ gnYfnYthi'UdUgnU'U'h'VYa i hU'1/2]U'Åg'U\_ 'ÅdYggÅ[ 'Ö^\_ÅdYggÅ[ Y\_ #i X'1/2]gnYfnÅgÅfY

5 ]bXU'ei Y'fUMU\U'Xc'Ya 'f]ha c'UW'YfUXcžYi 'b; c' gci 'bY[ ']] Ybh'Y'fUMU\c'Vt'a 'dfYW]g;cžgYbXcž dcfh'ubhcž'UXYei U'Xc'dUFU'U]g'XYa U'XU]g'Xc'fUMU\c' Vt'a c''''

5a ]\_cf[ 'n'cf]g]b\_ 'Y'YthXc' [cnbca\_ 'bU[ m'bnca\_ 1/2]U'U'h gYa\_ \U'bnU[ c'h]a\_ Y\_ 'U'dcbhcg]1/2'chiÅg'Ö[ m[ cbXc'ca ž \c[ mYa ]U'hi\_ Ø'Öb'Ög\_ 'ÅdYb\_ U\_ 'Ua U]g] U[ nC\_ 'U''''

5 bbU\_ 'Ya U[ mUf'1/2]g]fUž\c[ mia ]Åfh'YbbÅ'f' 'Uh'1/2]1/2]U'U'\_cf'1/2W]'a i b\_ U'UdUgnU'U]U]X'U'Ud'1/2

# A chj 1Wj g`Yj Å

Gci `WdUh`XY`a UbYf`i a `Uhc`dUXf`c`XY`fUMU`cZ`  
a Yga c`gcV`dfYgg`c`"

BU`mibnca 1gU`Uth]g\_`ÅdYgj U[ nc\_`a U[ Ugjgn]bj cbUcb  
Xc`[ crb]"

5 bbU\_`ÅfnÅ\_Y`hYhÅgÅfYz`c[ m\_`ÅdYgj U[ mia U[ Ugj][`ÅbnY\_`YhH`a UgnH`\_`ÖfbmYnYhYb`Xc`[ crb]

8 YgU`Zcfa U`Yi `hYf]U`U`cdcfh b]XUXY`XY`VtbWY]Uf`cg`  
a Yi g]bhYfYggYg`Vta `YgU`Vt`cVWÅ`c`"

Q`m`ÖgnY\_`UdVt`c`Uhb`1a `UgnYa `ÅmYg`ÅfXY\_` XÅg]  
\_`ÖfÖa`YhU`gU\_a U]`Y`Y`mYn\_`YXÅgYa a Y"

5 bbU\_`VYa i HU`h]g]fUz`c[ mignYa `ÅmYgYb`]g`bU[ ncb`ÅfXY\_` Xgn`Ua i b\_U]f`f`h

9i `hYb`c`YgdWYU`]bhYfYggY`Ya `#bc`#bU`""`Y`[ cgUf]U`  
hYf`U`cdcfh b]XUXY`#`WU`bW`XY`La d`]Uf`a`Yi`g`  
Vtb`Y`V]a`Ybhc`g`fUMU`U`bXc`Ya`#bc`#bU`""`fbca`Y`XU`  
Ya`dfYgU`"

¥`Åb\_`Yb`ÅfXY\_` XÖa`U`""`ÅgbU[ ncb`ÅfHÅ`YbÅa`U`  
`Y`Yh`gÅ]`Yh`c[ mU`h`X]`gca`UhV`j`fngYa`Uh`^`bÖ\_`Y`j`Uİ`  
\_`ÖnÖja`i`b\_U`gcf`1b`"

5 bbU\_`VYa i HU`h]g]fUz`c[ mignYa `ÅmYgYb`]g`bU[ ncb`ÅfXY\_` Xgn`Ua i b\_U]f`f`h

7 ca`c`dcXY`gYf`cVgYfj`UXc`bc`a`Yi`WffEW`c`UbYi`cZ`  
Ua`]b`U`Yi`dYf]`fVYU`Y`ei`U]Z]W`ÅN`Yg`Vt`ffYgdc`bXYa`  
Uc`g`f`Yei`]g]hcg`XYgU`d`cg]`Å`c`"

5a`]bh`1a`Uh`U`U`VgUhc`h`Öb`Å`Yf`U`nca`VU`b`Z`U`  
H`U`U`g`h`U`U`nca`Åg`U`g`U\_a`U]`\_`ÅdYg`f`ÅgYa`a`Y[`ZY`Y`b`Y\_`U`  
d`cn`É`Yj`1É`1g]U]bU`"

5 n`Öb`Å`Yf`U`nc`X`\_]`Ub[ gÖ`n`cn]`gU`cf`Åg`U`bbU\_`ÅfnÅ\_Y`hYhÅgÅfYz`c[ mia`Y`bbn]fY`]`YbY`c`n]X`Yn`Ua`i`b\_U`

A`]b`U`d`cg]`Å`c`U`h`U`Vta`c`""`XY`#`Xc`#`XU`""`za`Y`  
d`f`c`d`f`V]`cbci`U`cdcfh`b]XUXY`XY`fUMU`U`f`Ya`i`a`  
La`V]Y`b`h`XY`[`fi`dc`XY`U`h`dfYgg`c`z`cbXY`Å`YggYb`WYU`  
gYf`WdUh`XY`fUMU`U`f`Vta`Vt`Y[`Ug`Z]a`XY`  
Wa`d]f`f`df`hcg`"

>Y`Yb`Y[`]d`cn`É`Y]`a`VU`b`a`]bh`""`Y`Yh`gÅ]`Ya`j`Ub`  
a`Y[`H`U`U`g`h`U`b]`Z`c[`mia`]`nYb`bU[`mibnca`1gU`Uth`Z`  
VgU`U`U`U`b`Xc`[`crb]`Z`U`c`^`Å`h`z`b`h`c`g]`Ö`U`c`^`Å`1/2`U`  
Y[`nÖ`ha`\_`Ö`b]`U`U`h`É]`X`\_`h`Y`g`f`Å`g`Å`Yn`"

5 bbU\_`YÉf]g]fUz`c[ mia`]`nYb`h`X]`g`h`U`Vt`c`h]`1/2`Y`U`Y`Yb`Y[`]`a`i`b\_`X`gcf`1b`

5`Åa`XY`a`]b`U`g`f`Ygdc`bgU]`]XUXY`g`Vta`c`""`Z`Yi`  
h`Ua`VÅa`XY`gYbj`c`j`]`UW]`]XUXY`g`Vta`d`Yh`f`V]Ug`  
Ya`""`"

5`""`ZY`Y`gÅ]`\_`ÖfÖa`Öb`ZY`Ø`ZY`^`XhYa`U`\_`Ö`Yh`Yn`  
hYf`Ø`Yh`\_`Yb`]g`""`"

9i`hU`\_`ÅdYg`f`ÅgY`\_`#i`X]`g`YÉf]g]Uz`La`]`YhU`Y`Yb`Y[`]`1/2`1g`c`Xcb`\_`YfYgn]`gU`Vt`c`h]`1/2`Y`Åg`Ua`]`bYa`Z`h`Å`h`Yb`Ø`ZÖ[`]bY\_`  
Ö`gnY`g`nc`f`cg`U`b`U`Zc[`]U`\_`cn]`g]`d`cn`É`Yj`XXU`

## A chj 1Wj g`Yj Å ! ? ÅdYggÅ]Y\_#\_ÅgnÅ]Y\_` dcfh [ 1/2

a`U[`nbf`

A`]b`U`d`f]a`Y]fU`Éb[`]i`U`Å`""`za`Ug`h`Ua`VÅa`ZU`c`""`"

5`bn`ubn`Y`j`Ya`U`""`Z`XY`W`gn`Å`Y\_`""`"

5 n`Ubntubn`Y`j`YX`Åg`Uh`Y[`nÅV`Zc`mÅ`cbntub`VYgn`Å`hbn`Y`j`Y\_`YÉf]g]fU`

9i`ZU`c`""`Vta`Zi`fVYU`  
Gci`Zi`Yb`h`Ya`""`"

A`U[`Ug]gn]bhYb`VYgn`Å`Y\_`""`"

B`Ya`Ubntubn`Y`j`Z`XY`a`U[`Ug]gn]bhYb`VYgn`Å`hbn`Y`j`Y\_`YÉf]g]U`

# >Y Ybh\_ YnÅg A chj 1Wj g`Yj Å`



9i 'hYb\c`Vtcb\WVb Ybrc`]bhYfa YX]1/2c`XY`"" B Ya `UbntubnY`j`]`Åg`_`OnÅdgn]bhYb`VgnÅ`hibnY`j`Y`_`YÉf]g]U	?`OnÅdgn]bhYb`VgnÅ`Y`_`""
9i 'hYb\c`""`Ubcg`XY`YI`dYf]AÉV]U`XY`hfUMU`c`Ya #A`ta`c`""` 9[`miUXc]hi`Ø`h`Yf]`hYfØ`YhYb`gnYfnYfhi`UdUgnhU`UHU]X`_`YÉf]g]U	""`Å`j`'a`i`b`_`UHdUgnhU`UHU`fYbXY`_`YnYa`_`U`""
9i 'hYb\c`YI`dYf]AÉV]U`Ya`#A`ta`_`""` Gn]a`Éf]`[`ÅdYg`gnc`Zj`Yf]`ga`YfYhY`_`VYa`i`RUh]g]U	HUdUgnhU`h`""`ZY`\Ugnb]1/2`j`U[`nc`_`"
9i 'UMYX]h`c`hYf`U`Vtca`V]bUÅ`c`UXYeI`UXUXY`""`Y`""` 5`bbU`_`YÉf]g]U`É`c[`mia`Ybbn]fY`_`Y[`mYbg`Ö`ncnchU`_`U`_`ÅdYggÅ[`Y]X	¶[`m[`cbXc`ca`ž`c[`mU`""`ÅgU`""`a`Y[`ZY`Y` _`ca`V]b]1/2`U`fYbXY`_`YnYa`"
9I`W`YbhY`\UM]`]XUXY`XY`Vtca`i`b]WUÅ`c` =bZcfa`1/2`_`a`Y[`cgnh]g]U`Åg]V]ncbmcg]Xc`[`c`_`Ya`U[`ntUf]1/2]U`_`c`_`Å[`1/2]bU`_`	?`j`1/2`_`ca`a`i`b]_`1/2`g]_`ÅgngÅ[
F`UM]cV]b]c`XYXi`h]j`c` 6]ncbmcg]Xc`[`c`_`a`Y[`ÅfhÅg]`Åg[`ncf]g]Åg`\U`hÅ`cbm]Y`a`U[`ntUf]1/2]g]U	8`YXi`_`h]j`_`Åf]`Y`Åg
DYbg]La`Ybrc`"i`[`]Wt` 5`n`Y`_`ÅdnY`ÅgY`_`#`ChYhY`_`dfV]h]h`Åg]`f`_`1/2[`cbXc`ha`i`Xcb]j`U`i`gnYf`_`YgnhÅg]Y`ž`Ö`gg]YfU`_`1/2]U	@`c[`_`l`i`g[`cbXc`_`cX]1/2`g
<`UM]`]XUXYg`UbU`É]j]W]g` ?`ÅgngÅ[`_`U`Xc`[`c`_`f`Ågn`YhYg`ÅfhÅ`_`Y`ÅgÅfY`	5`bU]h]_`i`g]_`ÅgngÅ[`Y`_`
6`ca`fY`UM]c]b]La`Ybrc`]bhYfdYggc]U` 5`_`c`_`_`Å[`1/2`_`U`j`U`i`_`\U`hÅ`cbm]Y[`m]Ø`ha`_`_`Ö`X`Åg]Åg]`ca`a`i`b]_`1/2`fU]j`U`i`_`_`ÅgngÅ[	>`i`]bhYfdYfgncb]1/2]g]_`ÅgngÅ[
<`UM]`]XUXYg`XY`bY[`cV]UÅ`c` A`1/2]j`1/2]U`Uhc`_`U`j`U`i`_`\U`hÅ`cbm]Ø`h`YhY`Åg]`_`ÅgngÅ[`_`	>`i`h]1/2[`ntU]1/2]g]_`ÅgngÅ[
<`UM]`]XUXYg`XY`Vtca`i`b]WUÅ`c` 5`_`ÅgngÅ[`ž`c[`m]gc`_`Ya`VYf`Y`_`h]i`_`ÅdYg`\U`hÅ`cbntub`Y`_`UXb]`Uh`_`Ch`YhY]h`	9`_`UXi`_`_`ÅgngÅ[`#`DfYnYbh]1/2]g]_`ÅgngÅ[
A`chj`1/2]g]`Yj`Å`!`@`Yn]1/2]g]` dcf]h`[`1/2`	a`U[`ntUf`

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A chj 1Wj g`Yj Ā`



9gci `a i ]hc`a chj Uxc`Y`Ubg]c`dY`c`fUUV\c  
X]j Yfg]Z]WUxc`ei Yi a `Wf[ c`bYg]U`Ya dfYgU  
dfcdfV]cbU`

@Yn1f1g1/2`a Y[ ]ga ĀhY`j Yž\c[ mia Ybbr]fY`gnYfYbĀ`Uj 1/2`U`UhbU`\_Xc`[ cnb]`

Bu] ncb`a chj 1zhj U[ nc\_žĀgĀfĀa a Y`j Ā[ YrbĀa `U  
j 1žcnUhcga i b\_1žUa YmYh<sup>2</sup> bĀ\_`1žU`\_Ēb1židcnĒV]j  
bnĀ`h`U`h

9i `j Y`c`Ug`bcj Ug`Urf]Vi ]ĀĀNyg#Yg]U`dcg]Āc`Vta`c  
i a `Yi W`Ybh`XYg]Z]c`

@Yn1f1g1/2`a Y[ ]ga ĀhY`j Yž\c[ mia Ybbr]fY`gnYfYbĀ`Uj 1/2`U`UhbU`\_Xc`[ cnb]`

Ŧ[ ^`\_]\ĒĒ 1g`YbbY`gn1/a ca fUYnU`dcrĒV]j žUa YmYhia 1Ē  
bu] ncb`j 1Ēc`\_`"

9i [ cg]Uf]U`XY`hYf`U`cdcfh`b]XUXY`XY`X]g]W]h]f`a`U]g  
XYfU`Yg]gc`VfY`Uj U[ U`dYggc`U`a`Ybh`"

@Yn1f1g1/2`ZY`j ]`\_`U`h`U`b]`Y[ m`Y`Y`h`g]Ā[ Yg]b]hYf`Ā`h

5a Ybbr]mYb`Y`Y`h`gĀ[ j`U`b`f`1ž`gnĒĒ Yg]W]Vb`VYgnĀ`bĀa  
a Y[`<sup>2</sup> bĀ\_`Y`U`hcj 1W]f`Āgn`Yh`\_`YhY[ mgnYa ĀnYg]b]hYf`Ā`  
\_`YfYhĀ`Vb

A Yi `WffĒV`c`YbV`b]fU`gY`UbYi`c`dUfU`g`U  
UdfYV]UĀc`"

Gh]bXUfX`Zcfa i `U`UbbU`\_`YĒf1g]1ĒUž\c[ m]U`7J`U`V]U`hc`a`1b]m]U`b]`hU`1/2`U`

5n`ĀbĀ`YfU`hca`U`hU`V]U`hc`a`1b]m]U`b]`hU`1/2`U`

9i `dcggc`ZcfbYWf`fYZf]fV]Ugž`gY`bYWgg]1Ēc`"

Gh]bXUfX`Zcfa i `U`UffUž\c[ m]br]h`chj`U[ m]fYZfYbV]1/2`UX1g]1ĒU

5a Ybbr]mYb`gnĀ`gĀ[ Ygž`h`Xc`\_`fYZfYbV]1/2`h`c]`U`"

F YZf]fV]Ug]dcXYa`gYf`gc`]V]hUXUg]1/4#Uc`"

5 bbU`\_`YĒf1g]1ĒUž\c[ m]h`Xgn`c]nb]fYZfYbV]1/2`h`Āgž\c[ m]\_`h]\_`YfYggYbY`\_`ĀfY

F YZfYbV]1/2`h`"!"h`#`h`\_`Āf`Y`bY`\_`"

9gci `X]g]cbĒĒ Y`dUfU`Yb]fYj`]g]U`Ya`"

5 bbU`\_`U`h`Xca`1g]`\_`UX1g]1ĒUž\c[ mgn]U`UX`j`U[ m]Y[ m]b]hYf`Ā`fU

Gn1/a ca fUY[ m]b]hYf`Ā`a Y[ ZY`Y`bY`U`"

C Vf][ Uxc`dcf`gYi`hYa`dc`Y`V`bg]XYfUĀc`"5 [ i UfXc`U  
cdcfh`b]XUXY`XY`X]g]W]h]f`dYggc`U`a`Ybh`Ug]fU`hNyg  
dY`Ug]ei`U]g]gci`Udfcdf]Uxc`dUfU`Yg]U`dcg]Āc`"Dcf  
Z]j`cf`Yb]fY`Ya`V`b]h`Uc`V`ta`][`c`j`]U`"

5`dfYZf]1žY`Āf`Y`h`gĀ[ Y`\_`a`Y[ UX1g]1/2`Āg`U`Y`Y`bh`\_`YnĀg`1b]ĀnĀgĀf]h`ia`Y[ \_`ĀgnĀbĀgY`\_`cf`\`Ugnb1/2`U`hcg

? ĀgnĀbĀa`U`h]XY`Ānž`Ua`]hU`Y`Y`bh`\_`YnĀgYa`1b]ĀnĀgĀfY  
gnYb]hY`h`F`Ya`Ā`Ya`ž\c[ m]Ygn`Y`Y`h`gĀ[ Ya`gnYa`ĀnYg]b]jg  
\_`ZY`hYb]ž\c[ ma`]Āf`h] U[ nc`\_`U`\_`U`a`Ug]U`dcrĒV]j`fU`  
? ĀfYa`U`\_`Ā`Y`h`\_`Yn`Y`Āf`Y`h`gĀ[ Yb`\_`YfYggYb`"

7cfX]Ua`YbhYž

<]j`U`U`cgžV]Ā`nY`h]bYj`Y`]ga`YfYhYb

H]g]hY`Y`hY`ž

5hYbV]cg]Ua`YbhYž

<]j`U`U`cgžgnĀ`Yg`\_`ĀfYb`\`Ugnb1/2`hž]ga`Yf]hV]Ā`nY`h

H]g]hY`Y`hY`ž

>Y`Ybh\_YnÅg  
A chj 1Wj g`Yj Å`



7ca `Y`j UXU`Ygja Už  
< j Uu`cgž`bYa `kÖ `Y`hF`YXlž`]ga YfhVĹa nYth

H]gnh`Yth`ž

@Ya VfubÅUgž  
B Ya `j Uu`cgž`Øn`Yh`dUfhbYfY`\_`\_`Ön`ÖhžU`\_]`hY[ Yn XbY`\_`  
, Xj Ön`Yth`ž