

GSOE9830

9 Wcbca]W8 Y W]g]cb 5 b U mg]g]b 9 b []b Y Y f]b [

7ci fgY'Cj Yfj]Yk

GHJZ:7cbHJWh8YHJ]`g

7cbj Ybcfg

BUa Y	9a U]`	5j U]`UV]`] m	@cWJhjcb	D\cbY
8f"'G\]j U'5VXc`]	g"UVXc`]4 i bgk "YXi "Ui	\$\$"!"‱.\$\$"a]XXUm		
		UbX'Vm'Uddc]bha Ybh		

@YWhi fYfg

B Ua Y	9a U]`	5j U]`UV]`]m	@cWUh]cb	D\cbY
; i m5``]bgcb	0	\$\$`!`‰.\$\$`a]XXUm UbX`VmUddc]bhaYbh fkYY_'%)}Ł		f\$&Ł'-',))%-

GWkcc~7cbhJWh~abZcfa Uhlcb

@cWUhjcb

I BGK 'A YVX.Ub]WU``UbX'A Ubi ZUWi f]b['9b[]bYYf]b[

5]bgk cft\ 'Vi]`X]b['>%+ž'@Yj Y`'%

5Vcj Y 7 c ZZYY cb 7 Ua di g

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-.\$\$-).\$\$da ž'A cbXUm-: f]XUml

ł7`cgYX'cb'di V`]W\c`]XUmgž'GW\cc``gW\YXi `YX'Yj Ybhg'UbX'I b]j Yfg]hm'G\i hXck b

K YV

GWXcc`cZA YWXUb]WU`UbX'A Ubi ZUWi f]b['9b[]bYYf]b[

9b[]bYYf]b[Gh XYbhGi ddcfhGYfj]Wg

9b[]bYYf]b[*\DXi ghf]U\"HfU]b]b[

<u>I_BGK_'Gh_Xm5VfcUX'UbX'9I_V\\Ub[Y</u>'f\(\bar{I}\)cf b\Vci_bX'gh_XYb\text{lgk}

I BGK : i hi fY Ghi XYbhq

D\cbY

fŽ*%%Ł-',),)\$\$-BiWYigGhXYbh<iV

 $f\check{\mathbb{Z}}^*\%^*\&\&`-'\ ,\)\ `+^**\%^-'9b[\]bYYf]b[\ `^{\oplus}Xi\ glf]U``HfU]b]b[$

7ci fgY 8YHJ] g

7 fYX]hDc]bhg *

Gi a a UfmcZh\Y 7ci fgY

Dfc YWijb]hJuhjcb 'UbX'XYj Y`cda YbhžfYj]Yk 'cZdfUWJWJ'XYWJg]cb!a U_]b['dfcV`Ya g'UbX'fY`Yj Ubh hYWkb]ei YgžVYbYZh#Wcgh'UbU`mg]gž'hJa Y'j U`i Y'cZa cbYmžBca]bU``UbX`YZZYWJj Y']bhYfYghfUhYž'WU`W``Uhjcb]bj c`j]b['a i 'hJd`Y']bhYfYghiZcfa i 'UYž']bhYfbU``fUhY'cZfYhi fbž'dUmVUW_'dYf]cX'a Yh\cXž'Wca dUf]gcbg'cZ U`hYfbUhjj Y']bj Ygha Ybhgž'XYdfYWJUhjcb'a Yh\cXgž']bWca Y'HUI 'Wcbg]XYfUhjcbž']bZUhjcbž'fYd`UWYa Ybh'UbU`mg]gž gYbg]hjj]hmUbU`mg]gž`]ZY!WhWY'Wcgh]b[žYWcbca]WUbU`mg]g'cZdfc'YWg"

7 ci fgY 5]a g

H\Y'Wci fgY'Wcbg]ghg'cZhk c'gYWf]cbg.

- GYWIcb %fK YY_g %) LB Yh7 Ug\: `ck 'UbX'9 Wcbca]W=bX]WUrcfg •
- 'GYW1cb'&'fK YY_g'*!\\$\text{F} \]q_'5bU\ma\]q

H\Y`Wci fgY`k]```ZcW g`cb`dfcj]X]b[`Wca dfY\Ybg]j Y`Wcj YfU[Y`cZh\Y`WcbWfdhg`cZYWcbca]WXYW]g]cb
UbU`mg]g`]b`Yb[]bYYf]b[`UbX`k]``U`gc`UXXfYgg`dfUW]WU``WcbWffbg`cZYb[]bYYf]b[`YWcbca]WUbU`mg]g"`H\Y
cVYW]j Y`cZh\Y`Wci fgY`]g`hc`dfcj]XY`Yb[]bYYfg`UbX`a UbU[Yfg`k]h\`h\Y`_bck``YX[Y`cZdf]bW]d`YgžVUg]W
WcbWfdg`UbX`a Yh\cXc`c[mcZYWcbca]WXYW]g]cb`UbU`mg]g"`H\]g`k]```Ugg]ghighi XYbhg`]b`XYj Y`cd]b[
dfcZ]W]YbWnk]h\`h\Y`a Yh\cXg`UbX`k]h\`h\Y`dfcWfggYg`Zcf`a U_]b[`fUh]cbU``XYW]g]cbg`h\YmUfY``]_Y`mhc
YbWci bhYf`]b`dfcZYgg]cbU``dfUW]WY"

7ci fgY @YUfb]b['Ci hWca Yg

5 ZYfgi WWgqZ ``mWa d`YNb['h\]g'Wa fqYžmci 'g\ci `X'VY'UV`Y'hc.

@YUfb]b['Ci hWca Y	95 GHJ[Y %7ca dYHYbW]Yg
%"5dd`mih\Y`_bck`YX[Y`cZgmghYaUh]WYjU`iUh]cb`cZh\Y`Wcghg`UbXVYbYZ]hg`cZdfcdcgYX`hYW\b]WU``UbX`Vig]bYgg`dfc^YWhUbX`jYbhifYg	D9%"&ž'D9%"' ž'D9&"(
&"I bXYfgHJbX'WcghWcbWYdhgž'WJg\'Zck gž'h\Y]f'Ygh]a Uh]cb'UbX]bhYfYghZcfa i `UY"'5`gcž'hc'i bXYfgHJbX'j Uf]ci g'XYdfYW]Uh]cb a Yh\cXg'UbX'`YUfb'UVci hh\Y'YZZYWhcZ]bWca Y'HJI 'cb'YWcbca m ghi X]Yg	D9%'&ž'D9%'' ž'D9' "(
' "'6Y'ZJa]']Uf'k]h\'j Uf]ci g'a Yh\cXg'Zcf'YWcbca mghi X]Yg'UbX Wca dUf]b['U'hYfbUh]j Y']bj Ygha Ybhg	D9&"' ž'D9&"(ž'D9' "(
("'I bXYfglUbX'h\Y'fc`Y'cZdfcVUV]`]lmiUbU`mg]g']b'XYW]g]cb'a U_]b[UbX'XYW]g]cb'lfYY'UbU`mg]g	D9%"%ž"D9%"&ž"D9%"' ž"D9&"(ž D9' "(
) "'J U`i Y`]bZcfa Uh]cb'UbX'UbU`mgY'U'dcfhZc`]c'cZ]bj Ygha Ybhg	D9&"%ŽD9&"&ŽD9&"' ŽD9' "%Ž D9' "*
*"'7 Uffmici hiA cbhY'7 Uficig]a i `Uh]cbg	D9&"%ŽD9&"&ŽD9&"' ŽD9&"(

HYUWX]b['GhfUhY[]Yg'

 $FYUX]b[g`UbX``YWi fYg`k]```VY`i gYX`hc`]blfcXi WY`UbX`YI d`U]b`h\Y`h\YcfYh]WU``Zci bXUh]cbg`cZj Uf]ci g\\YWcbca]WUbU`mg]g`df]bW]d`Yg''`DfcV`Ya 'gc`j]b[`YI YfW]gYg`k]```VY`i gYX`hc 'Udd`mUbX`fY]bZcfWY`h\Y i bXYfgHUbX]b[`cZh\Y`WcbWYdhg`UbX`\ck 'h\YmWUb`VY`Udd`]YX`hc 'gc`j Y`dfcV`Ya g`YbWci bhYfYX`]b`h\Y`fYU` k cfX"`Ghi XYbhg`UfY`YI dYWhYX`hc`Wca d`YhY`h\Y`Ugg][bYX`fYUX]b[g`df]cf`hc``YWi fYg`gc`h\Uhih\Ym`WUb$

5ggYgga Ybh

5ggYgga YbhHUg_g

5ggYgga Ybh'hUg_	K Y][\h	8i Y'8UHY	Gh XYbh@YUfb]b[Ci hWca Ygʻ5ggYggYX
A cXi `Y%!7`Ugg'HYgh	&\$I	Bch5dd`]WUV`Y	%ž'&ž''
A cXi `Y`% 7`Ugg`HYgh	' \$1	Bch5dd`]WUV`Y	%ž [.] &ž [.] '
A cXi `Y`&!`:]bU``YbX!cZhYfa Yl Ua]bUh]cb`) \$1	Bch5dd`]WUV`Y	(ž)ž*

5ggYgga Ybh'8YHJ]`g

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GhUfhiXUhY. "\$&#%\$#&\$&\$ "\$-.\$\$ "5A

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8YHJ]`g.

H\Y'YI Ua ']bWi XYg'`YWi fY'a UhYf]U``Zfca 'k YY_'%'UbX'&'UbX'k]``\UddYb'Xi f]b['h\Y'k YY_'' 'WUgg"'

5ggYgga Ybh'& 'A cXi 'Y'%7'Ugg'HYgh

GhUfh'XUhY. '%* #%\$#&\$&\$ '\$-.\$\$ '5A

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 $HYYIUa k] ``VuddYb Xi f]b[hYk YY_') WUgg"'$

5ggYgga Ybh' . A cXi `Y`&! :]bU``YbX!cZhYfa `Yl Ua]bUh]cb

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8 YW] g.

 $H\Y'Z bu``YIUa]bUh]cb`Zcf`h\Y`WcifgY`]g`U'kf]hhYb`YbX!cZhYfa`YIUa]bUh]cb`cZhkc`\cifg`XifUh]cb`UbX`k]``]bWiXY`aUhYf]U``WcjYfYX`]b`AcXi`Y`&"`$

5XX]h]cbU`XYhU]`g.

FYgci fWyg

DfYgWf]VYX F Ygci fWYg

@YWhifYcih]bYgžWcifgYbchYg'UbX'YIYfW]gYg'k]``VY'dfcj]XYX'cb'AccX`Y"

? aaVW, \hdg.##a ccX`Y"hY`h"i bgk "YXi "Ui #c[]b#bXYI "d\d

FYWca a YbXYX FYgci fW/g

•

HYI h6cc_'%

K "; "'Gi``]j Ubž'9"A "'K]\(\w_q\)z'7"D"'?cY``]b[\\\z'\)b[\\\]bYYf]b[\'9\\c\)bca m'\\\\z'\)DfYbf]\(\w\)''<U``

₺h/fbUh/cbU`ž¨%+h\ '9X"ž'&\$% "

H\]g"hYI hVcc__']g"Uj U]`UV`Y "Zcf"di fVXUgY "Uhih\Y"I BGK "Vcc__'g\cd"

HYI h'6cc_'&'fcdhcbU'Ł

"8 YW]g]cb '5 bU'mg]g 'Zcf' DYlfc 'Yi a '91 d'cfUl]cb" Z'DUi `BYk YbXcfd'UbX'>c\b'GWXi m\Yfz'D`Ubb]b['DfYgg'&\$\$\$

G@EI > [ToSok i WTe [fWUS` TWSUUWeeW Sf \hdg. #k k k "`]VfUfm'i bgk "YXi "Ui #

7 ci fgY 9j U'i Uhcb UbX 8 Yj Y'cda Ybh

: YYXVUW_cb^h\Y`Wci fgY^]g^[Uh\YfYX^dYf]cX]WU^mi g]b['j Uf]ci g^a YUbgz^]bWi X]b['h\Y`I BGK a m9I dYf]YbW'dfcW'ggz^]bZcfa U`X]gW gg]cb^]b^h\Y`Z]bU^WUgg^Zcf^h\Y`Wci fgYzUbX^h\Y`GW\cc^*g Gh XYbh#GhUZZa YYh]b[g"'Mci f^ZYYXVUW_]g^hU_Yb^gYf]ci g`mzUbX^Wcbh]bi U``]a dfcj Ya Ybhg^UfY^a UXY^hc^h\Y Wci fqY^VUqYXz^]b^dUfhz^cb^gi W\ZYYXVUW_"

±0 'h\]g'Wci fgY'fYW'bh]a dfcj Ya Ybhg'fYgi `h]b['Zfca 'dfYj]ci g'mYUfg' 'ZYYXVUW_']bWi XY'a cfY'fYU'!`]ZY Yl Ua d`Yg'UbX'WJgY'ghi X]Ygž'Ug'k Y```Ug'dfcV'Ya g'gc'j YX']b'XYa cbghfUh]cb'UbX'dfcj]XYX'cb'A ccX'Y"'5```cZ h\YgY'gi [[Ygh]cbg'UfY']bWcfdcfUhYX']bhc'h\Y'Wci fgY'gm`UVi g"

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

5ggYgga Ybhgi Va]gg]cb UbX a Uf_]b[Wf]hYf]U

G\ci`X'h\Y'WcifgY'\UjY'Ubmbcb!Y`YWfcb]WUggYgga Ybh'gi Va]gg]cbž'h\YgY'g\ci`X'\UjY'U'ghUbXUfX GW\cc`'WcjYf'g\YYh'

5```gi Va]gg]cbg`UfY`YI dYWYX`lc`VY`bYUh`UbX`WYUf`mgYhci h'`Mci f`fYgi `hg`UfY`h\Y`d]bbUWY`cZU```mci f`\UfX k cf_'UbX`g\ci `X`VY`lfYUh'X`k]h\`Xi Y`fYgdYWf'`DfYgYbh]b[`fYgi `hg`WYUf`m[]j Yg`h\Y`a Uf_Yf`h\Y`VYghW\UbW' cZi bXYfgHUbX]b[`mci f`a Yh\cX/Yj Yb`]Zh\Y`bi a Yf]WU``fYgi `hg`UfY`]bWcffYWf

A Uf_]b['[i]XY`]bYg`Zcf`Ugg][ba Ybhgi Va]gg]cbg`k]```VY`dfcj]XYX`Uhh\Y`gUa Y`h]a Y`Ug`Ugg][ba YbhXYhU]`g hc`Ugg]ghk]h\`a YYh]b['UggYggUV`Y`fYei]fYa Ybhg"`Gi Va]gg]cbg`k]```VY`a Uf_YX`UVWcfX]b['hc`h\Y`a Uf_]b[[i]XY`]bYg`dfcj]XYX"

@UhY 'dc`]Wh

 $\label{thm:condition} $$HY^UHY'dYbU'mm]g'Udd']YX'dYf'WUYbXUf'XUmf]bWi X]b['k YY_YbXg'UbX'di V']W\c`]XUmgŁ'h\Uh'h\Y UggYgga Ybh']g'cj YfXi Y'''H\YfY']g'bc'dfc!fUhU'cZh\Y''UhY'dYbU'mmZcf'gi Va]gg]cbg'a UXY'dUfhk Umh\fci [\'UXUm'$

K cf_'gi Va]hh'X`'UZh'f'h\Y`'XYUX`]bY`Zcf`'UVgc`i h'Y`ZJ]`'`]g'bchUVWVdh'X`'UbX`U'a Uf_'cZnYfc`k]```VY`'Uk UfXYX Zcf`h\Uh'UggYgga Ybh']h'a "

: cf`gca Y`UggYgga Ybh`]hYa gž`U``UhY`dYbU`hma UmbchVY`Uddfcdf]UhY"`H\YgY`UfY`WYUf`m`]bX]\WUhYX`]b`h\Y Wci fgY`ci h`]bYž`UbX`gi W\`UggYgga Ybhg`fYWY]j Y`U`a Uf_`cZnYfc`]ZbchWca d`YhYX`Vmh\Y`gdY\\JZ]YX`XUhY" 9I Ua d`Yq`]bWi XY.

%" K YY_`mcb`]bY`hYghg`cf``UVcfUhcfmk cf_`k cfh\`U`ga U```dfcdcfh]cb`cZh\Y`gi VYWha Uf_žcf &" C b`]bY`ei]nnYg`k \YfY`Ubgk Yfg`UfY`fY`YUgYX`hc`gh XYbhg`cb`Wca d`Yh]cbžcf

- ' "DfcZYgg]cbU``UggYgga Ybh'hUg_gž'k\YfY`h\Y`]bhYbh]cb`]g`hc`WfYUhY`Ub`Ui h\Ybh]WUggYgga Ybh'h\Uh\Ug`Ub`UVgc`i hY`gi Va]gg]cb`XUhYžcf
- ("DUgg# U]`UggYgga YbhHJg_g"

91 Ua]bUh]cbg

Mci 'a i gh'VY'Uj U]`UV`Y'Zcf'U```ei]nnYgž'hYghg'UbX`YI Ua]bUh]cbg": cf'Wci fgYg'h\Uh\Uj Y'Z]bU``YI Ua]bUh]cbgž h\YgY'UfY'\Y`X'Xi f]b['h\Y'I b]j Yfg]hmYI Ua]bUh]cb'dYf]cXg.': YVfi UfmZcf'Gi a a Yf'HYfa ž'A UmZcf'H%ž 5i [i gh'Zcf'H&ž'UbX`Bcj Ya VYf#8 YWYa VYf'Zcf'H' "

D`YUgY'j]g]ha m BGK 'Zcf'Dfcj]g]cbU``91 Ua]bUh]cb'h]a YhUV`Y'di V`]g\'XUhYg": cf'Z fh\Yf']bZcfa Uh]cb'cb Yl Ua gž'd`YUgY'gYY'h\Y'<u>91 Ua g</u>'k YVdU[Y"

GdYW/U`7cbg]XYfUhcb

⊋mci `\Uj Y`YI dYf]YbW/X`Ub`]``bYgg`cf`a]gUXj Ybh fY`VYmcbX`mci f`Wcblfc``h\Uhk]```]bhYfZYfY`k]h\`mci f

I BGK 'bck '\Ug'U':]hhc'G]h#Gi Va]hfi 'Y

5 WUXYa]W<cbYghmUbX D`U[]Uf]ga

 $\label{lem:bound} I \ B G K \ ``Ug`Ub`cb[c]b[`Wcaa]ha Ybhhc`ZcghYf]b[`U`W`h fY`cZ`YUfb]b[`]bZcfa YX`VmUWJXYa]W]bhY[f]hm'`5``I B G K ``gh XYbhg`\Uj Y`U`fYgdcbg]V]`]hmhc`UX\YfY`hc`h\]g`df]bW]d`Y`cZUWJXYa]W]bhY[f]hm'`D`U[]Uf]ga$

5 WUXYa]W = b Zcfa Uh cb

7 fYX]hdc]bhg

7 ci fgY'WfYX]hi]g'WU'W'`UhYX']b'I b]hg!C Zi 7 fYX]hifl C 7 L"'H\Y'bcfa U``k cf_`cUX'YI dYWfUh]cb'Zcf'cbY'I C 7]g'UddfcI]a UhY`m'&) '\ci fg'dYf'hYfa "'H\]g']bWi XYg'WUgg'WcbhUWh'\ci fgž'df]j UhY'ghi Xmž'ch\Yf'`YUfb]b[UWfj]]h]Ygž'dfYdUfUh]cb'UbX'h]a Y'gdYbh'cb'U``'UggYggUV`Y'k cf_"

A cghWci fgYk cf_'Wci fgYg'Uhl BGK 'UfY'*'I C 7 'UbX']bj c'j Y'Ub'Ygh]a UhYX'%) \$'\ci fg'hc'Wca d'YhY'''9UW\ Wci fgY']bWi XYg'U'dfYgWf]VYX'bi a VYf'cZ\ci fg'dYf'k YY_'fl\#\ E'cZgW\YXi 'YX'ZUWY!hc!ZUWY'UbX#cf'cb`]bY WcbhUWi'5bmUXX]h]cbU`'hja Y'VYmcbX'h\Y'dfYgWf]VYX'WcbhUWi\ci fg'g\ci 'X'VY'gdYbh]b'a U_]b['gi fY'h\Uh mci 'i bXYfghUbX'h\Y''YWi fY'a UhYf]U'ž'Wca d'Yh]b['h\Y'gYhUgg][ba Ybhgž'Z fh\Yf'fYUX]b[ž'UbX'fYj]g]b['Zcf UbmYl Ua]bUh]cbg"

Cb!WUa di g WUgg UHYbXUbW

Di V`]WX]gHJbW]b[`WcbX]h]cbg'a i gh'VY`Zc``ck YX`Zcf'U```H' `ZJ\WY!hc!ZJ\WY`WUggYg":Hc`Ybgi fY`h\]gž'cb`m ghi XYbhg`Ybfc``YX`]b`h\cgY`WUggYg'k]```VY`U``ck YX`]b`h\Y`fcca "`7`Ugg`fcghYfg`k]```VY`UhtUW\YX`hc WcffYgdcbX]b[`fcca g`UbX`W]fW``UhYX`Ua cb[``UV`XYa cbghfUhcfg"'Bc'cj Yf!Ybfc`a Ybh]g`U``ck YX`]b`ZJ\WY!hc! ZJ\WY`WUgg"'Ghi XYbhg`Ybfc``YX`]b`cb`]bY`WUggYg`WJb`gk Ud`h\Y]f`Ybfc`a YbhZca 'cb`]bY`hc'ch\Yf`UXX]h]cbU`ž' Vi h``]a]hYXž'bi a VYf`cZcb!WJa di g`WUggYg`VmGi bXUmž'K YY_`%"D`YUgY`fYZYf`hc`mci f`Wci fgYfg`A]\WcgcZh HYUa g`UbX`A ccX`Y`g]hYg`Zcf'a cfY`]bZcfa Uh]cb`UVci h`WUgg`UhhYbXUbWY`Zcf']b!dYfgcb`UbX`cb`]bY`WUgg gY\W]cbg#J\W]j]h]Yg"

Mci f`\YU`h\`UbX`h\Y`\YU`h\`cZh\cgY`]b`mci f`WUgg`]g`Wf]h]WU``mi]a dcfhUbh''Mci 'a i ghighUmUh\ca Y`]Zmci 'UfY q]W_`cf`\Uj Y`VYYb`UXj]qYX`hc`qY`Z]qc`UhY`VmBGK_'\YU`h\`cf`[cj Yfba Ybh'Ui h\cf]h]Yq"'7 i ffYbh'U`Yfhq`UbX`U

- 5ddfcj YX 7 U W `Uhcfg
- 5WUXYa 1W<cbYghmiUbX'D'U[]Uf]ga

a dcfhUbh'@]b_g

- <u>A ccX`Y</u>
- <u>@UV:5\W\Ygg</u>
- < YU`h\ 'UbX'GUZYhm

5ddYbX]I . '9b[]bYYfg'5i ghfU`]U'f95Ł'DfcZYgg]cbU` '9b[]bYYf'7ca dYhYbWm GHJbXUfX

Dfc[fUa '±bHYbXYX'@YUfb]b['Ci HWca Yg	
?bck `YX[Y`UbX'g_]```VUgY	
D9%%7ca dfY\Ybg]j Yžfh\YcfmVUgYX'i bXYfgfUbX]b['cZfh\Y'i bXYfd]bb]b['bUhi fU`'UbX d\mg]WU`'gWJYbWYg'UbX'h\Y'Yb[]bYYf]b['Z bXUa YbfU`g'Udd`]WUV`Y'hc'h\Y'Yb[]bYYf]b['X]gWJd`]bY	
D9%"&"7cbWYdh U``i bXYfgHJbX]b['cZh\Y'a Uh\Ya Uh]Wgžbi a Yf]WJ``UbU`mg]gžgHJh]gh]Wgž'UbX Wca di hYf`UbX`]bZcfa Uh]cb`gW]YbWYg`k\]W\`i bXYfd]b'h\Y'Yb[]bYYf]b['X]gW]d`]bY	
D9%" =: XYdh\ i bXYfghUbX]b[icZgdYW]U`]ghVcX]YgicZ_bck iYX[Yik]h\]bih\ YiYb[]bYYf]b[X]gW]d`]bY	
D9%"('8]gWfba YbhcZ_bck `YX[Y`XYj Y`cda YbhUbX`fYgYUfVX 'X]fYWf]cbg`k]h\]b`h\Y Yb[]bYYf]b['X]gW]d`]bY	
D9%") '? bck `YX[Y`cZYb[]bYYf]b['XYg][b`dfUWf]WY`UbX`WcbHYl hi U``ZUWhcfg`]a dUWf]b['h\Y Yb[]bYYf]b['X]gW]d`]bY	
D9%"* I bXYfgHJbX]b['cZh\Y'gWcdYž'df]bW]d`Ygž'bcfa gž'UWWci bHJV]`]h]Yg'UbX'Vci bXg'cZ gi gHJ]bUV'Y'Yb[]bYYf]b['dfUW]WY']b'h\Y'gdYW]Z]WX]gW]d`]bY	
9b[]bYYf]b['Udd`]WUh]cb'UV]`]hm	
D9&"%5dd`]WUhjcb`cZYgHUV`]g\YX`Yb[]bYYf]b[`a Yh\cXg`hc`Wca d`Yl 'Yb[]bYYf]b[`dfcV`Ya gc`j]b[
D9&"&": `i YbhiUdd`]WUh]cb'cZYb[]bYYf]b['hYW\b]ei Ygž'hcc`g'UbX'fYgci fWYg	
D9&" '5dd`]WUh]cb`cZgmghYa Uh]WYb[]bYYf]b['gmbh\Yg]g'UbX`XYg][b'dfcWYggYg	
D9&"('5dd`]WUh]cb'cZgmghYa Uh]WUddfcUVXYg'hc'h\Y'WcbXi WhUbX'a UbU[Ya YbhcZYb[]bYYf]b[dfcYWng	
DfcZYgg]cbU`'UbX'dYfgcbU`'UHff]Vi HYg	
D9' "%'9h\]WU`'WcbXi WiUbX'dfcZYgg]cbU`'UWWci bhUV]`]hm	
D9' "&'9ZYWNjjY'cfU``UbX'k f]hhYb'Wcaai b]WUhjcb']b'dfcZYgg]cbU``UbX'`UmXcaU]bg	
D9' "' '7 fYUhjj Yž']bbcj Uhjj Y'UbX'dfc!UWhjj Y'XYa YUbci f	
D9' "('DfcZ/gg]cbU`i gY'UbX'a UbU[Ya YbhcZ]bZcfa Uh]cb	
D9' ") 'C fXYf`ma UbU[Ya YbhcZgY`Zë'UbX`dfcZYgg]cbU``WcbXi Wh	
D9' "* '9ZZYW¶j Y'HYUa 'a Ya VYfg\]d'UbX'HYUa '`YUXYfg\]d	