

FchYbVif[YfghUfhYb]bX]Y: ØbZ_UadZ! AY]ghYfgWXUZhYba]hbYiYaHYUa°

Hi G`FchYbVi f['i bX`GW\@hnYbW\cf`ghUfhYb`_`Ugg]gW\Yb : @bZ_Ua dZ`HfU]b]b[gUb[YVchž'8]gn]d`]bYb`i bX A Y]ghYfgW\UZhYb`]a ': c_i g"

@Yj Yf_i gYbž8Yi hgWX`UbX`!`5a `+"`A Àfn`&\$&) `VYfY]hYb`g]W.`XYf Hi G`F chYbVi f[`i bX`XYf`GWXØhnYbWxcf`XYf`?fY]gghUXh`]bhYbg]j `Ui Z]\fY`YfghY`J YfUbghU`hi b[`]a `_`Ugg]gWXYb`: ØbZ_Ua dZj cf"`8]YgY A Y]ghYfgWXUZhYb`g]bX`Y]b`VYXYi hYbXYf`GWXf]hh`ZØf`X]Y``c_U`Y GdcfhgnYbY`i bX`gc``Yb`Y]bYb`9]bV`]W_`]b`X]Y`gY]h`XYb`%- &\$Yf ***J\fYb`VYghY\YbXY`GdcfhUfh`[YVYb"`8]Y`8]gn]d`]bYb`XYg _`Ugg]gWXYb`: ØbZ_Ua dZg`i a ZUggYb`@i Zh[Yk Y\fgWX]Y`*Ybž ?i [Y`ghc`*Ybž`GWXk]a a Yb`i bX`8Y[YbZYWXhYb`i bX`V]YhYb XYb`HY]`bY\a Yfb`X]Y`A O[``]WX_Y]hž`]\fY`J]Y`gY]h][_Y]h`i bhYf`6Yk Y]g ni `ghY``Yb"`9g`]gh`k]WXh][`ni `Yfk À\bYbž`XUgg`XYf`_`Ugg]gWXY : ØbZ_Ua dZb]WXhc`ma d]gWX`]ghž`]a `; Y[YbgUhn`ni a `A cXYfbYb : ØbZ_Ua dZžXYf`HY]`XYf`C`ma d]gWXYb`Gd]Y`Y`]gh"

: Øf X]Y 'VYj cfghY\YbXYb 'K Yhh_Àa dZY 'g]bX 'j YfgWX]YXYbY
I hYbg]']Yb 'YfZcfXYf']WX ž'XUfi bhYf'6UXY_UddYbž'Gd]_Ygž
9]gYb_i [Y`bž'@ Zh[Yk Y\fY'i bX'8Y[Yb"'8]Y'Cf[Ub]gUh]cb'X]YgYf
A Y]ghYfgWX UZhYb'`]Y[h'gY]h'XYf'GU]gcb'&\$&' #&\$&(']b'XYb'<\AbXYb
XYg'8 Yi hgWXYb': YWXhYf!6i bXYg'fB: 6½*XYf'Ui WX'XUg'N]Y`'j YfZc`[hž
HY]`bY\a Yf'ZØf'X]Y'cZZYbYb'bcfXXYi hgWXYb'A Y]ghYfgWXUZhYb'Ua '+"
A U]']b'GU`n\Ui gYb'gck]Y'X]Y'8Yi hgWXYb'A Y]ghYfgWXUZhYb'Ua '&, "
\$ b]']b'A i bghYf'ni 'ei U`]Z]n]YfYb"</pre>

HfU]b]b[i bX < YfUi gZcfXYfi b[Yb

 $\label{eq:GY_hcvyf} $$GY]hC_hcVYf^&&&(~\hb)^5bYhhY^AYmYf^Y]b^HfU]b]b[gUb[YVch]bg$

@YVYb'[Yfi ZYbž'XUg'b]W\h'bi f'J]Y`ZU`h']b'XYb'GdcfhUfhYb'ZÒfXYfhž gcbXYfb'Ui W\'U`g'D`UhhZcfa 'ZØf'; YbYfU`]ghYb'X]Ybh''5_hi Y``bY\a Yb'Yhk U'&\$'HY]`bY\a Yf']a '5`hYf'j cb'%%'V]g'*\$'\J\fYbfY[Y`a À»]['Ub'XYb'HfU]b]b[gY]b\Y]hYb'hY]`"'6YgcbXYfg\YfUi gZcfXYfbX'g]bX'X]Y'j YfgW\]YXYbYb'8]gn]d`]bYbž'XU'GW\]Y»YbUbXYfY': À\][_Y]hYb'YfZcfXYfh'U`g': YW\hYbž'k À\fYbX'XUgGW\]Y\Yb'_Ubž'k À\fYbX'XUg

8]Y fY[Y`a À»][Yb 'HfU]b]b[g'ZØf'GW\]Y» Ybž: YW\hYb'i bX
GW\k]a a Yb'\UVYb']a :: YVfi Uf'&\$\&\) 'VY[cbbYbž'k\À\fYbX'k\Y]hYfY
9]b\Y]hYb'ZØf'@Ui ZYb'i bX'?i [Y`ghc» Yb']b'XYb'_ca a YbXYb
K cW\Yb'[Yd`Ubh'g]bX"'\DhYfYgg]YfhY'_\ObbYb'g]W\'X]fY_h'Ub'5bYhhY
A YmYf'k\YbXYbž'i a 'a Y\f'ØVYf'XUg'HfU]b]b[gUb[YVch'ni
YfZU\fYb"

8 Yi hgWX Y A Y]ghYfgWX UZhYb]a 8 Y[YbZYWX hYb

DUfU``Y``ni `XYb'J cfVYfY]hi b[Yb']b'F chYbVi f['ZUbXYb'X]Y

8 Yi hgWXYb'A Y]ghYfgWX UZhYb']a '8 Y[YbZYWX hYb']b'@Yj Yf_i gYb
ghUhh" 8]YgY'J YfUbghU`hi b['nY][hY 'ghUf_Y'@Y]ghi b[Yb'j cb'%('
9]bnY`k YhhVYk YfVghY]`bY\a Yfb'i bX'' %'HYUa g'Ui g') + 'J YfY]bYbž
k cVY]'HY]`bY\a Yf'Ui g'XYb'5`hYfg_`UggYb'j cb'%- &' 'V]g'&\$\$+
j YfhfYhYb'k UfYb" 8]Y'9]bnY`!'i bX'HYUa k YhhVYk YfVY'k i fXYb'ØVYf
nk Y]'HU[Y'Ui g[YhfU[Yb'i bX'VfUWXhYb'gdUbbYbXY
9f[YVb]ggY": 5@G'VYf]WXhYh'j cb'XYb'9]bnY`k YhhVYk YfVYbž']b

XYbYb'@]gU'A Uf]Y'@O\f'i bX'A UmU'6]YbYZY`X'ZØf'XUg': YWXhNYbhfi a
Gc`]b[Yb'UbhfUhYb"'@O\f'YffY]WXhY'bUWX 'ghUf_Yb'?Àa dZYb'XYb'%"
D`Uhnž'k À\fYbX'6]YbYZY`X'XYb'(\$"'D`Uhn'VY`Y[hY"'6Y]'XYb'< YffYb
_cbbhY'*J_cV'GhUb[Y'XYb'&\$"'D`Uhn'YffY]WXYb"

8 Ugʻ8 Ua Yb!HYUa ʻj cbʻ: YWXhNYbhfi a ʻGc`]b[YbʻVY`Y[hYʻXYbʻ+"D`Uhnžik À\fYbXʻXUgʻ<YffYbhYUa ʻXYbʻ, "'D`UhnʻYf`Ub[hY"'8]Y A Y]ghYfgWXUZhYbʻj YfXYi h`]WXhYbʻb]WXhʻbi fʻX]Yʻ\c\Y K YhhVYk YfVgZÀ\][_Y]hʻXYfʻHY]`bY\a YfžʻgcbXYfbʻUi WXʻX]Y k]WXh][YʻFc``YʻXYgʻ8Y[YbZYWXhYbgʻ]a ʻXYi hgWXYbʻGdcfh"

 $8\,Y\,f'_`Ugg]gWX\,Y':\,\varnothing b\,Z_Ua\,d\,Z'\,\backslash\,Uh'gY]b\,Y'K\,\,i\,\,fnY`b']a\,\,^{'}A\,\,c\,X\,Y\,fb\,Y\,b$

: ØbZ_Ua dZiXYf'j cb'6Ufcb'D]YffY'XY'7ci VYfh]bz'XYa '6Y[fØbXYf XYf'a cXYfbYb'C`ma d]gWXYb'Gd]Y`Yz']bg'@YVYb'[Yfi ZYb'k i fXY" 8]YgY'GdcfhUfh'j YfY]bh'VØf[Yf`]WXY' ?Uj U`]Yf!GdcfhUfhYb'k]Y
: YWXhYbz'FY]hYb'i bX'GWX]Y» Yb'a]h'J c`_ggdcfhUfhYb'k]Y
GWXk]a a Yb'i bX'@Ui ZYbz'k Ug'Y]bY'VYa Yf_Ybgk YfhY'8]j Yfg]hÀh']b
XYb'HfU]b]b[ga Yh\cXYb'i bX'K Yhh_Àa dZYb'V]YhYh''8]Y
9bhk]W_`i b['XYg'A cXYfbYb': ØbZ_Ua dZg'gY]h'XYggYb'DfYa]YfY
%- %&'VY]'XYb'C`ma d]gWXYb'Gd]Y`Yb'\Uh'XUni 'VY][YhfU[Ybz'XUgg
X]Y'8]gn]d`]bYb'ghÀbX]['U_hi U`]g]Yfh'i bX'Ub'X]Y'6YXØfZb]ggY'XYf
5h\`YhYb'Ub[YdUggh'k YfXYb"

8 Y hU]`g	
Cfh	@YjYf_igYbž'8YihgW\`UbX
EiY``Yb	k k k "_fY]gnY]hi b["XY
	• k k k "ZU`g"XY
	• k k k "a Z_!h\i Yf]b[Yb"XY

6Ygi WXYb G]Y i bg Ui Z b!U["XY