



ARTS3295

I bXYfghUbX]b['B Un]; Yfa Ubm`C f][]bgž`Ghfi Wfi fYgž
9I d`UbUh]cb

HYfa `H\fYY`##`&\$%-

7ci fgY`Cj Yfj]Yk

`GHUZZ7cbhUWhi8YHU]`g`

`7cbj Ybcfg`

B Ua Y	9a Uj`	5j Uj`UVj]m	@cWUhc b	D\cbY
F cVYfh6i WX	F cVYfh6i WX4 i bgk "YXi "Ui	6mUddc]bha Ybh	A cfj Yb`6fck b &(-	-',)!, *(

GWXcc``7cbhUWhi`bZcfa Uh]cb

GWXcc``cZ<i a Ub]hYg`UbX:@Ub[i U[Yg

@cWUhc b. `GWXcc``C Z]WZA cfj Yb`6fck b`6i]X]b[ž@Yj Y``&ž&),

CdYb]b[`<ci fg.`A cbXUm! : f]XUmž - Ua `!) da

D\cbY. `ž*%&`-' ,) `)%*, %

: Ul. `ž*%&`-' ,) ; +\$)

9a Uj]. [\U`4 i bgk "YXi "Ui](#)

7ci fgY'8YHJ]`g

7fYX]hDc]bHg`*`

Gi a a UfmicZħY'7ci fgY

Gi VYWh5fYU.: [efack

H\]g'Wci fgY'Wb'U'gc'VY'gh X]YX'j'b'ħY'Zc'ck]b['gdYW]U'gU]cbg.'9 Wd_ S` E fgV[Wē- 7gdabWS` E fgV[Wē

H\Y'H\]fX'F Y]W\`UghY'X'a YfY'miħk Y'j Y'mYUfg'mYh]h'cca g'Uf[Y']b'ħY'a Ya cfmicZa cXYfb'; Yfa Ubnž
9i fcdYžUbX'j'bXYX'ħY'k cfX''`b'ħ.]g'Wci fgYžmci 'k]`'hU_Y'U'WcgY''cc_`UhħcgY'ħk Y'j Y'mYUfg'UbX'ħY]f
Z]hU''Y[UWh'`Hcd]Wg']bW' XY'; Yfa Ubnmž'`f]gdYW]U'dUħf'ħc'a cXYfb]mž'ħY'Wc''UdgY'cZħY'K Y]a Uf'F Ydi V]Wž
ħY'Wc'bW'dhg'cZ]Jg]Wga'`UbX'ħc'ħU']fU]Ub]ga ž'ħY'Z' bW]cb]b['cZħY'g'fU]h'UddUfU]h'g']b'ħY'H\]fX'F Y]W\ž'ħY
fc'Y'cZħY': Ø\Yfž'UgdYW'g'cZB Un]]XYc'c[miUbX'W'`h'fU'dc'W]mž'UbX'ħY'cf][]bg'cZħY'<c'c'W]i gh'`Mci 'k]`
'YUfb'`ck'ħc'W]h]W'`mYI Ua]bY'dc'di'Uf'fYdfYgYb'U]h]cbg'cZB Un]; Yfa UbnmUbX'ħc'ħ.]b_UVci hħY
i gYž'`bYggž'UbX'ħY''ja]h]h]cbgž'cZj Uf]ci g'ħY'cfY]h]W'UddfcUW]Yg'ħc'ħY'i bXYfg'ħUbX]b['cZgi W
U'Wc'a d'YI '\]g'ħc'f]W'`d\Ybca Ybcb"

7ci fgY'@YUfb]b['Ci hWc'a Yg

%`9i d'U]b'ħY'cf][]bgžYj c'i h]cb'UbX'X]g]b'fU]h]cb'cZB Un]; Yfa Ubn'
&" 8]gh]b[i]g\ž'Wc'a dUfYž'UbX'Yj U'i Uħ'X]ZYfYbhdUfUX][a g'Zc'f']b'fYdfYh]b['ħY'H\]fX'F Y]W\`
' " 7cbgfi W'Uf[i a YbHg'VmXfUk]b['cb'YI]gh]b[]b'fYdfYh] Y'dUfUX][a g'UbX'Wc'b'fYa dc'fUfm
\]g'ħc'f]c[fUd\]W'Wc'b'f'c] Yfg]Yg'Uvci hB Un]; Yfa Ubn'
(" 8Yj Y'cd'U'gYbgY'cZcbY'f]Uggi a d]h]cbg'UbX'd'fYWc'bW'd]h]cbg'UbX'U'k]`]b[bYgg'ħc'W'U''Yb[Y
cbYgY'Z'UbX'ħc'ħ'g'ħc'bY'f]fYW]j YX'j]Yk g"
) " 7ca a i b]W]h]ž'cf'U'miUbX'f'f]b'k f]h]b[ž'ZYW]j Y'miUbX'd'fYgYb'ħk cf_]`b'U'a UbbYf'ħ'U'ħ'Wc'b'Z'fa g'ħc
gW'c'U'f'f'Wc'b] Yb]h]cbg'UbX'gi VYWh[i]XY'j]bYg"

HYUW]b['G'fU]h] []Yg`

H\Y''YUfb]b['UbX'ħ'UW]b['gh'fU]h] [m]g'XYg][bYX'ħc'YbWc'i fU[Y'gh X]YbHg'ħc'Yb[U[Y'k]ħ'XYVU]h]g'Uvci h
B Un]; Yfa UbnmžXYj Y'cd]b['ħY]f'W]h]W'g_]`g'ħ'fci [\`a i'`h]d'Y'a cXYg'cZħY'UW]b['UbX'UggYgga Yb'ħ'

@YWh fYg'Wc'a V]bY'U'\]g'ħc'f]W'`k]ħ'U'g'mgh'Ya U]h]W'UddfcUW'ħc'ħY'[]j Yb'ħc'd]WcZU'k YY_"`5Xcd]h]b['U
fci [\`m'W'f'bc'c[]W'UddfcUW'ħY'Zc'W'g']g'cZ'Y'b'ħ'Ya U]h]W'X]Yc'c[m'UYg'ħ'Y]h]Wg/[c] Yfb'UbW'g'c'W]U'ž
[YbXYfž'UbX'fUW'`dc'W]Ygž'Y'ħ'W'K \]Y'gca Y'XY[fY'cZVUW_] fci bX'`bck'YX[Y'g'Uggi a YXž'Ym
XYj Y'cda YbHg'UbX'ħ'fb]b['dc]bHg'k]`VY'fYj]Yk YX'`<ck Yj Yfž'ħY'df]b'W]dU'`Zc'W'g']g'cb'X]ZYfYbh
]b'fYdfY'U]h]cbg'UbX'd'YfgdYW]j Yg'cb'ħY'H\]fX'F Y]W\ž'fYZYW]b['ħY'Yj c'i h]cb'cZħY'\]g'ħc'f]c[fUd\m'cZB Un]
; Yfa Ubnm'@YWh fYg'd'f'c]j XY'ħY'Z'Ua Yk cf_'Zc'fYUX]b[g'X]g'W'ggYX'j'b'ħY'ħ'ħc'f]U'g"

H\Y'ħ'ħc'f]U'g'fYj c]j Y'Ufci bX'W]h]W'fYUX]b[g'Ug'k Y''Ug'gca Y'df]a Ufm'ħ'ħ'g''K Y'k]`'U'gc'X'fUk'`cb'ch'Yf

5ggYgga Ybh

Gua d'Y hYghUbgk Yfg UbX'hY'YI dYWUhcbg'Zc'f'hY'YggUmik]`VY'X]gW ggYX]b'XYHJ`Xi f]b['hY'gYWcbX hi hcf]U`gYgg]cb"

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y'8UH	Gh XYbh@YUfb]b[Ci hWca Yg'5ggYggYX
F YgYUfW'9ggUm	()	&- #/6#&,\$%- '\$(.,\$\$'DA	%&Z ž(ž)
!WUgg'hYgh	' \$	&) #/\$#&,\$%-	%&Z ž(ž)
K f]hYb'fYgdcbgYg'hc fYUX]b[g`	&)	Bch5dd']WUVY	&Z ž)

5ggYgga Ybh8YHJ]`g

5ggYgga Ybh% F YgYUfW'9ggUm

GHUfhXUH`.

8YHJ]`g. 'H\Y'&) \$\$!k cfX'YggUmig\ci `X'VY'U'gi VghUbh]U`d]YW'cZ]bXYdYbXYbhfYgYUfW'ž'fYZYW]cb'UbX UbU'mg]g": YXVUW`fi Vf]WUbX'Vf]YZ]bX]j]Xi U`Wca a Ybhg]b'A ccX'Y""H\]g]g'hY'Z]bU`UggYgga YbhZcf UH'bxUbW'`di fdcgYg"

5ggYgga Ybh&. !WUgg'hYgh

GHUfhXUH`. Bch5dd']WUVY

@Yb[h. '* \$'a bg

8YHJ]`g. 'Gh XYbhg'Wca d'YH'U'hYghcZW'%\ci f'Xi fU]cb""h\Y'hYghWcbg]ghg'cZg\cfhUbgk Yfg'UbX dUfU[fUd\!`Yb[h'Ubgk Yfg'hc'ei Ygh]cbg'XYg][bYX'hc' []j Y'gh XYbhg'hY'cddcfh b]mhc'XYa cbghUH'hY]f i bXYfghUbX]b[`cZ'hY'hYa Ygž]ggi Yg'UbX'XYVUH'g'Wc] YfYX']b'hY'Wci fgY"Gh XYbhg'fYW]j Y'U'a Uf_" F YgdcbgYg'X]gW ggYX]b'WUgg"

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

H\Y]b!WUgg'hYghHU_Yg'd'UW'Xi f]b['hi hcf]U`\ci fg]b'k YY_`* ž: f]XUm&) `C WcVYf'&\$%- "

5ggYgga Ybh' . K f]hYb'fYgdcbgYg'hc'fYUX]b[g

GHUfhXUH`. 7cb]bi ci g'mZca `k YY_`%"

@Yb[h. '&) \$'k cfXg'l) `cj Yf'hY'Wci fgY'cZ'hY'hYfa

8YHJ]`g. 'K YY_`mei Ygh]cbg'cb'hY'fYUX]b[g'k]`Y'd'gh XYbhg'XcW a Ybh'hY]f'fYUX]b[`UbX'h]b_]b[`cb'hY a UH'f]U""Gh XYbhg'k]`bYX'hc'gi Va]hZ] Y'gYhg'cZ'fYgdcbgYgž'YUW'cZa UI]a i a `&) \$'k cfXgž'cj Yf'hY'hYfa Wcbg]gh]b[`cZU'fYgdcbgY'hc'cbY'cZ'hY'fYUX]b[g'cZU []j Yb'k YY_`UbX'U'X]gW gg]cb'ei Ygh]cb'cZ'hY]f'ck b

Gi Va]gg]cb'cZ5ggYgga YbhHUg_g

Gi Va]gg]cb'cZ5ggYgga YbhHUg_g

Hi fb]hb'Gi Va]gg]cb

zrci YbWci bHyf'U'dfcV'Ya 'k \Yb'UHYa dh]b['hc'gi Va]hrci f'Ugg][ba YbhHfci [\ 'Hi fb]hbzd'YUgY
HY'Yd\cbY'9I HYfbU'Gi ddcfhcb'-',) ' ' ' %cf'Ya U]'HYa 'cb'YI HYfbU'HY'fgi ddcfh4 i bgk "YXi "Ui "'Gi ddcfh
\ci fg'UfY', .\$\$Ua '-'%\$. \$\$da 'cb'k YY_XUmg'UbX'-. \$\$Ua '-') . \$\$da 'cb'k YY_YbXg'fI *) 'XUmg'U'mYUfL"'zrci
UfY'i bUV'Y'hc'gi Va]hrci f'Ugg][ba YbhXi Y'hc'U'ZU' 'hk]H'Hi fb]hb'mci 'a UmUdd'm'Zcf'Ub'YI HYbg]cbz'Vi hrci
a i ghfYH]b'mci f'h]W_Yhbi a VYf'Z'ca '9I HYfbU'Gi ddcfhfU'cb['k]H'UbmcH'Yf'fY'Yj UbhXcW a Ybhg'hc
]bWi XY'Ug'Yj]XYbW'hc'gi ddcfhrci f'YI HYbg]cb'Udd']W]h]cb"'zrci 'Ya U]'9I HYfbU'Gi ddcfhrci 'k]'
Ui 'ca U]W]m'fYW]j Y'U'h]W_Yhbi a VYfz'Vi h]Zrci 'HY'Yd\cbY'mci 'k]'b'YX'hc'gdYW]W]m'Ug_'Zcf'cbY"
Hi fb]hb'U'gc'dfcj]XYg'i dXUH'g'cb'HY]f'gmgh'Ya 'ghU'g'cb'Hk]HYf"

; YbYfU'mz'UggYgga YbhHUg_g'a i ghVY'gi Va]HYX'Y'YWfcb]W]mj]U'Y]H'Yf'Hi fb]hb'cf'U'A ccX'Y
Ugg][ba Ybh' 'b]bgHUbW'g'k \YfY'h']g']g'bchidcgg]V'YZ]hk]'VY'g'H'X'cb'mci f'Wci fgY'g'A ccX'Y'g]HY'k]H
U'HYfbUH] Y'gi Va]gg]cb'XYH]g"

: cf']bZ'fa U]cb'cb'\ck 'hc'gi Va]hUgg][ba Ybh'cb']bY'j]U'A ccX'Y. \Htdg.#gh XYbH'i bgk "YXi "Ui #ack!
gi Va]hUgg][ba Ybh'a ccX'Y

5 WUXYa]W<c bYghmiUbX`D`U[]Uf]ga

D`U[]Uf]ga `]g`i g]b[`hY`k cfXg`cf]XYUg`cZchYfg`UbX`dfYgYbh]b[`hYa `Ug`mci f`ck b" `hWUb`hU`Y`a Ubm
Zcfa gZ`Zca `XY`]VYfUHY`WXYU]b[`hc`UWV]XYbhU`mW`dm]b[`Zca `U`gci fW`k]h`ci hUW_bck`YX[Ya Ybh`

I BGK `[fci dg`d`U[]Uf]ga `]bhc`hY`Zc`ck]b[`WUHY[cf]Yg.

7 cdm]b[.`i g]b[`hY`gUa Y`cf`j Yfmg]a]Uf`k cfXg`hc`hY`cf][]bU`hYI hcf]XYU`k]h`ci hUW_bck`YX[]b[`hY`
gci fW`cf`i g]b[`ei chU]cb`a Uf_g" `H\]g`U`gc`Udd`]Yg`hc`]a U[YgZ`UfhUbX`XYg][b`dfc`YWgZ`Ug`k Y`Ug
dfYgYbhU]cbg`k \YfY`gca YcbY`dfYgYbh]g`UbchYf`g`]XYUg`cf`k cfXg`k]h`ci hWYX]h`

hUddfcdf]UHY`dUfUd`fUg]b[.`7`Ub[]b[`U`ZYk `k cfXg`UbX`d`fUgYg`k \]Y`a cghmiFYhU]b]b[`hY`cf][]bU`
ghfi W`i fY`UbX`#`f`dfc[fYgg]cb`cZ]XYUg`cZ`hY`cf][]bU`Z`UbX`]bZcfa U]cb`k]h`ci hUW_bck`YX[Ya Ybh`H\]g`U`gc
Udd`]Yg`]b`dfYgYbhU]cbg`k \YfY`gca YcbY`dUfUd`fUgYg`UbchYf`g`]XYUg`cf`k cfXg`k]h`ci hWYX]hU`bX`hc
d]YW]b[`hc[YhYf`ei chYg`UbX`dUfUd`fUgYg`]bhc`U`bYk `k \c`Yz`k]h`ci hUddfcdf]UHY`fYZYfYbW]b["

7 c`i g]cb.`k cf_]b[`k]h`chYfg`Vi hdUgg]b[`cZ`hY`k cf_]Ug`U`dYfgcb`g`]bX]j]Xi U`k cf_]7 c`i g]cb`U`gc
]bWi XYg`dfcj]X]b[`mci f`k cf_]hc`UbchYf`gh`XYbhVYZc`fY`hY`Xi Y`XUHYz`cf`Zc`f`hY`di fdcgY`cZ`hY`a

- i bXYfghUbx'mci f'f][\hg'UbX'fYgdcbg]V]h]Yg'Ug'U'gh XYbhUhl BGK
- VY'Uk UfY'cZd'U[]Uf]ga ž'Wc'dmf][\hž' BGK 'Gh XYbh7cXY'cZ7cbXi W'Ubx'5W'W'dhUV'Y'I gY'cZ I BGK '⇒H'F'Ygci f'W'g'Dc`]W'h
- VY'Uk UfY'cZ'Y'ghUbxUfXg'cZVY\Uj]ci f'YI dY'W'X'cZYj Yfmcby']b'h'Y'I BGK 'W'a a i b]m
- 'cW'W'h'gYfj]W'g'UbX']bZ'fa U]cb'UVci hl BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZ'Y'gY'UfY'Ug'k]''VY'ZJa]]Uf'hc'mci ž'c'h'Yfg'k]''VY'bYk "'; U]b]b['U'gc`]X'i bXYfghUbx]b['cZU''h'Y fY'U'Y'X'UgdY'W'g'cZ9@-G9'k]''\Y'd'mci 'a U_Y'h'Y'a cghcZmci f'gh X]Yg'Uhl BGK ""

[\h'hd.##gi V'Y'W'i \]X'Yg" \]VfUfm'i bgk "YXi "Ui #' \]gY#\]Vci h' \]gY](#)

5 WUXYa]WbZcfa Uh]cb`

: cfYggYbh]U`ghi XYbh]bZcfa Uh]cb`fY`Uh]b[`rc.

- fYei Ygh]Zc`fYI hYbg]cb/
- `UhY`gi Va]gg]cbg`[i]XY`]bYg/
- fYj]Yk `cZa Uf_g/
- I BGK `<YU`h`UbX`GUZY`mdc`]WYg/

