



ARTS2845

GYI ž<i a Ub'F][\hg'UbX'>i gh]W

HYfa 'Hk c''##'&\$%

7ci fgY`Cj Yfj]Yk

`GHZZ7cbhJW`i8YhJ]`g`

7ci fgY'8YhJ]`g

5ggYgga Ybh

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y'8UHŸ	Gh XYbh@YUfb]b[Ci hWta Yg'5ggYggYX
HYgh	(\$	K YY_) 'UbX'K YY_-'	*
9ggUmi) \$	\$- #\$, #&\$%- '%%) - 'DA	%ž&ž(ž)
Hi hc f]U`F Ydcfh	%\$	\$- #\$, #&\$%- '%%) - 'DA	'

5ggYgga Ybh8YHU]`g

5ggYgga Ybh% 'HYgh

GHUfhXUHŸ.`

8YHU]`g. 'Hk c'cb]bY 'hYghžYUWV 'k c f h '&\$| žk]''VY'\Y'X]b'K YY_) 'UbX'K YY_-' 'cZ h Y'gYa YghŸf''9UWV hYghk]''VY'a Uf_YX'k]h]b' h k c'k YY_g'cZgi Va]gg]cb'UbX'hY'gh XYbŸg'k]''fYWŸ] Y'bi a Yf]WU'' [fUXYg"

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

Mci 'UFY'fYei]fYX'hc'Xc'hY'Ugg][bYX'fYUX]b[g'Yj Yfmk YY_'Ug'hY'VUg]g'Zcf'hi hc f]U`X]gW gg]cb''H\YgY fYUX]b[g'UbX'chYf'Wci fgY'k cf_'U'gc'Zcfa'hY'VUg]g'Zcf'hY'ZfghUggYgga Ybhž'Ub'cb]bY'ei]n'hU]bj'c]j Yg g\cfh]Ubgk Yfg]'b'K YY_) "'H\Y'gYWcbX'cb]bY'ei]n'hU_Yg'hY'Zcfa'cZUb'UbU'mg]g'cZU'g\cfhdUggU[Y fY'UH'X'hc'Wci fgY'ei Ygh]cbg"'Mci f'UbU'mg]g'g\ci 'X'VY'Uddfcl]a UH'mi+) \$!%\$\$\$k cfXg'cb["'Mci 'k]''bchVY dYbU]gYX'Zcf'[c]b['cj Yf'hY'k cfX''ja]hž'Vi hid'YUgY'fYa Ya VYf'hU]h]h]g'ja dcf]Ubh'hc'VY'gi WŸ]bWŸh'UbX'hc Uj c]X'VY]b['cb[!k]bXYX']b'U''k f]hY'b'k cf_'-Z'hY'Wta a YbŸg'cb'mci f'k f]hY'b'k cf_'UFY'bc hgi ZŸWŸYbhm \Y'dž žk Y'WŸb'cZ'Wci fgY'X]gW gg'mci f']XYUg'UbX'ei Ygh]cbg"

g]a]Uf]mfYdcfng"

5ggYgga Ybh&. '9ggUm

GHUfhXUHY. '

8YHU]`g. 'Gh XYbng'gi Va]hUb]bX]j]Xi U`YggUmf&) \$\$'k cfXgE" E i U`]h]j Y`ZYXVUW`UbX`U`bi a Yf]WU`[fUXY
UfY`fYh fbYX`hc`gh XYbng`k]h]b`h`b`k cf_]b[`XUmg`cZXi Y`XUHY`"H\Y`UggYgga YbhW]h`f]U`UfY`Uj U]UV`Y`hc
gh XYbng`Uhh\Y`ghUfhcZgYa YghYf`gc`h`Uhh`YmW]b`k cf_`hck UfXg`gdYWZ]YX`ghUbXUfXg" H\]g`]g`h\Y`ZbU`
UggYgga Ybh]b`h\]g`Vei fgY`Zcf`h\Y`di fdcgYg`cZh\Y`Uhh`bXUbW`fYei]fYa Ybh'

5ggYgga Ybh' . 'Hi hc]U`F`Ydcfh

GHUfhXUHY. '

8YHU]`g. 'Gh XYbng'gi Va]hUb]bX]j]Xi U`fYdcfhcb`h\Y]f`h`hc]U`dfYdUfU]cb`UbX`dUfh]W]dU]cb`f) \$\$'k cfXgE"
H\Y`UggYgga YbhW]h`f]U`UfY`Uj U]UV`Y`hc`gh XYbng`Uhh\Y`ghUfhcZgYa YghYf`gc`h`Uhh`YmW]b`k cf_`hck UfXg
gdYWZ]YX`ghUbXUfXg" 'Gh XYbng`k]`fYW]j Y`ZYXVUW`k]h]b`h`b`k cf_]b[`XUmg`cZgi Va]gg]cb"

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

H\Y`YggYbh]U`fYUX]b[g`Zcf`YUW`k YY`_UfY`a Uf`_YX`k]h`Ub`Ughf]g`_]b`hY`k YY`_mgW\YXi`Y"

F YWca a YbXYX`F Ygci fWg

5g`bchYX`UVcj Yzh`hcf]U`g`dfYgi ddcgY`h`Uhmci` \Uj`Y`fYUX`UbX`a UXY`Ub`\cbYghUHY`a dhlc`i`bXYfghUbX`hY`fYei`]fYX`fYUX]b[`Zcf`YUW`k YY`_zk` \]W\`]g`ghUffYX`]b`hY`Wci`fgY`[i`]XY`VY`ck`"

h]g`]a`dcf]Ubh]h`UhiUg`W]h]nYbgz`UbX`ghi`XYbhg`cZdc`]h]Mgz`mci`fYUX`Uh`YUghcbY`[ccX`bYk`g`gci`fW`XU]`mfZcf`YI`Ua`d`Yzh`hY`cb`]bY`9`gSd/[S`cf`@W`Kadj`F`_`Wc`]g`UXYei`UH`Lz`Ug`k`Y`Ug`k`YY`_mUbX`a`cbh`m`ci`fbU`g`h`Uhdfcj`]XY`]bZcfa`Uh]cb`UbX`Uf[i`a`YbhUVci`h`hY`ghUHY`cZ`hY`k`cfX`"D`YUgY`ZY`Z`fY`h`Ug`_`hY`7`ci`fgY`7`ccfX]bUhf`Zcf`gi`[[Ygh]cbg`UVci`hch`Yf`Vcc`_gz`Ufh]WYg`cf`k`YV`

[: cc\['Y'UbX': cc\['Y'GWXc'Uf](#)

CZwci fgY''Mci 'Wb'gYhi d'hY'dfYZfYbW'g'hc''b_'; cc['Y'GWXc'Uf'hc'hY'I B GK '@]VfUfmYj Yb'k \Yb'mci UfY'bchcb'Wla di g.'[c'hc'; cc['Y'GWXc'Uf2'gYh'ib[g2''VfUfm''b_gz'UbX'Yb'hf'i b]j Yfg]micZBYk 'Gci h' K U'Yg''b'hY'Vcl 'Zcf' '@VfUfmi"

[I b\]h'X'B'Uhc'bgz'UbX'I B'K'ca Yb](#)

H\Y'I B'g]h'c'ZYfg'UW'W'gg'hc'XcW a Yb'hg'z'XYW]g]cbg'UbX'Yj Yfmi'h]b['Y'gY'hc'Xc'k]h'hY'I B'fUg'h'Y'g]h'Y']g [] [Ub]h'Vz'h]g'gca Y'h'a Yg'ei]W'Yf'hc'gYUfVX'Zcf'I B'XcW a Yb'g'i'g]b[': cc['Y'

[5i ghfU'Ub'@Y\[U' bZc'fa Uhc'b' bgh'h h'f'bi gh@+](#)

H\]g'g]h'Y'dfcj]XYg'UW'W'gg'hc'Ub'YI h'Ybg]]Y'gY'YW]cb'cZdf]a UfmUbX'gYW'cbXUfm5i ghfU'Ub''Y[U''a U'h'f]U'gz' UbX'\Ug'']b_g'hc'a Ubm]b'h'fbUhc'bU''Y[U''XUfUVUgYg'UbX'Y'YW'fcb]W'ci fbU'g"

[5i ghfU'Ub'DUf\]Ua Ybh](#)

H\]g'g]h'Y'dfcj]XYg'UW'W'gg'hc'XYVU'h'gz'Y[]g'Uhc'b'z'W'a a]h'Y'g'z'dUf]Ua Yb'Uf'mk \c'g'k \c'Y'h'W'z'k]h'U'X][]h'U' gYUfVX'cZfYV'c'Xg'Zfca '%-\$%Uh'DUf' bZc'z'UbX']bj U'i UV'Y'di V']W]h'cbg'Uh'h'Y 'DUf]Ua YbhUfm@VfUfmi"

[< \] \[\ '7 ci fhcZ5i ghfU' \]U](#)

H\Y'7 ci fh'g'\ca Y'dU[Y'c'ZYfg'XYW]g]cbg'z'fUbgW]d'hg'z'fYW'bhgdYYW'Yg'z'V]c[fUd\]Yg'cZ'h'Y' ↑ X[Yg'z'Y'h'W'

[< i a Ub'F \] \[\ hg'K U'h'W'z'Ygd''K'ca Yb'g'F \] \[\ hg](#)

[9i fcdYUb'7 ci fhcZ<i a Ub'F \] \[\ hg](#)

7 UgYg'UbX'c'h'Y'f'a U'h'f]U'Zfca 'h'Y'9i fcdYUb'7 ci fh'

[I b\]h'X'? \]b\[Xca 'DUf\]Ua Ybh](#)

H\]g'g]h'Y'c'ZYfg'UW'W'gg'hc'Vch'dc']h'W''UbX''Y[U''XYW]g]cbg'z'd'i g'U''h'Y'i gi U''gh' Zcb'[c] Yfba Ybh''H\YfY UfY'U'gc'gYdUfU'h'k YVg]h'g'Zcf'h'Y 'GW'fh'g'\': c] Yfba Ybh'f]U[\U'h'Ug'bU'\15'VU'z'h'Y'K'Y'g'\': c] Yfba Ybh' f@mk cXfUY'h'7 ma fi t'z'UbX'h'Y' B'cf'h'Y'fb' f'Y'UbX'9i YW'h] Y' @cgg]V'Y'Q

[H\Y'K \ \]h'Y'< ci gY](#)

CZ]W]U'k YV'g]h'Y'Zcf'h'Y'K \]h'Y'< ci gY'UbX'h'Y' () ^h' DfYg]XYb'hcZ'h'Y'I G5"

[Gi dfYa Y'7 ci fhcZ7 UbUXU](#)

H\]g'g]h'Y'dfcj]XYg'UW'W'gg'hc'XYW]g]cbg'cZ'h'Y'Gi dfYa Y'7 ci fhcZ7 UbUXU"

[Gi dfYa Y'7 ci fhcZ'h'Y'I b\]h'X'G'h'U'g](#)

H\]g'g]h'Y'c'ZYfg'I G'Gi dfYa Y'7 ci fh'XYW]g]cbg'Ug'k Y''Ug'c'hg'cZ'h'Y'f'a U'h'f]U''"

[CmYn](#)

H\]g'I G'Gi dfYa Y'7ci fhA i`hja YX]U'g]h' d'fcj]XYg'UWVWgg'rc'cfU'Uf[i a YbhgžhfUbgWf]d'hg'UbX'WUgYg"

A Ubmch.Yf'i gYZ ``XUHUVUgYg'UfY'Uj U]UV'Y'j]U'hY [L.BGK_@VfUfmk.YVg\]h.ž](mailto:L.BGK_@VfUfmk.YVg]h.ž)

7ci fgY'9j U'i Uh]cb'UbX'8Yj Y`cda Ybh

5hi BGK žgih XYbhYj U'i Uh] Y'ZYXVUW_]g'[UH.YfYX'dYf]cX]WU`mi g]b[žUa cb['ch.Yf'a YUbgžh.Y
a m9I dYf]YbW' d'fcW'gg" Gh XYbhZYXVUW_ 'cb'h.]g'Wci fgY]g[UH.YfYX'h'fci [\ 'a m9I dYf]YbW' Yj U'i Uh]cbg
Uh'h.Y'YbX'cZ'h.Y'Wci fgYžUbX'UhUbm]hja Y'gih XYbhg'UfY'k Y'Wca Y'rc'Ya U]'cf'gdYU_'rc'h.Y'7cbj Ybcf'UVci h
ei Ygh]cbg'cf'dfcV'Ya g''h]g'gca Yhja Yg'h.Y'WUgY'h.Uhgh XYbhg'i bXYfg]UbX'h.Y'g][b]Z]W]bW'cZgca Y'cZ'h.Y
dfcV'Ya g'W'bg]XYfYX'cb'mUZYf'h.Y'Wci fgY]g'Z'fa U'm'Wca d'Yh'Xž'UbX'gih XYbhg'UfY'U'gc'U'k Umg'k Y'Wca Y
rc'W'cb]UW'h.Y'gYa]bUf'7cbj Ybcf'UZYf'WUggYg'\Uj Y'Z]b]g\YXžYj Yb'a Ubm]YUfg'UZYf'h.Y'Wci fgY'\Ug
YbXYX''5''ZYXVUW_]g'WUfYZ ``m'W'bg]XYfYXž'fYZYW'X'i dcbž'UbX'i gYX'rc'Yj U'i UH'UbX'fYZ]b'U''UgdYWg
cZ'h.Y'Wci fgY"

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Hi fb]hb`Gi Va]gg]cb

≠mci`YbWci`bhYf`U`dfcV`Ya`k`Yb`U`H`Ya`dh]b[`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybh`h`fci`[`\`Hi`fb]hb`z`d`YUgY`
H`Y`d`l`cb`Y`9I`H`f`b`U`Gi`ddcfh`cb`-`,`)``%`cf`Ya`U`H`Ya`cb`YI`H`f`b`U`H`f`gi`ddcfh`4`i`bgk`"YXi`"Ui`"Gi`ddcfh`
`l`ci`fg`UfY`,`.\$\$Ua`-`%\$.\$\$da`cb`k`YY`XUmg`UbX`-`.\$\$Ua`-`).\$\$da`cb`k`YY`YbXg`f`l`*)`XUmg`U`m`Y`Uf`l`"≠mci`
UfY`i`bUV`Y`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybh`Xi`Y`hc`U`Z`U`h`k`]h`Hi`fb]hb`mci`a`Um`Udd`m`Z`f`Ub`YI`H`f`bg]cb`z`Vi`hmc`i`
a`i`gh`f`Y`h]b`mci`f`h]W`Y`h`bi`a`VY`f`Z`ca`9I`H`f`b`U`Gi`ddcfh`f`U`cb[`k`]h`Ub`m`c`h`Y`f`f`Y`j`Ub`h`X`c`W`a`Y`b`h`g`l`hc`
]b`W`i`X`Y`U`g`Y`j`]X`Y`b`W`hc`gi`ddcfh`mci`f`YI`H`f`bg]cb`Udd`]W`h]cb"≠mci`Ya`U`9I`H`f`b`U`Gi`ddcfh`mci`k`]`
Ui`hc`a`U`h]W`m`f`Y`W`j`Y`U`h]W`Y`h`bi`a`VY`f`z`Vi`h]Z`mci`H`Y`d`l`cb`Y`mci`k`]`b`Y`Y`X`hc`gd`Y`W`Z`W`m`U`g`_`Z`f`cb`Y`
Hi`fb]hb`U`gc`d`fc`j`]X`Y`g`i`d`X`U`H`g`i`cb`h`Y`j`f`g`m`g`h`Ya`g`h`U`h`g`i`cb`H`k`]h`Y`f`"

;`Yb`Y`f`U`m`z`Ugg`Y`gga`Y`bh`h`U`g`_`g`a`i`gh`V`Y`gi`Va`]h`Y`X`Y`Y`W`f`cb]W`m`j`]U`Y`]h`Y`f`Hi`fb]hb`cf`U`A`cc`X`Y`
Ugg][`ba`Y`bh`h`b`]b`g`h`U`b`W`g`k`Y`f`Y`h`l`g`]g`b`c`h`i`d`c`g`g]V`Y`z`]h`k`]`V`Y`g`h`U`H`X`i`cb`mci`f`W`ci`fg`Y`g`A`cc`X`Y`g`]h`k`]h`
U`h`f`b`U`h]`Y`gi`Va`]gg]cb`X`Y`h]`g`"

:`cf`]b`Z`c`fa`U`h]cb`cb`l`ck`hc`gi`Va`]h`Ugg][`ba`Y`bh`g`cb`]b`Y`j`]U`A`cc`X`Y`.\`h`td`g`#`g`h`X`Y`b`h`i`bgk`"YXi`"Ui`#`ack`!
gi`Va`]h`Ugg][`ba`Y`bh`a`cc`X`Y`"

5 WUXYa]W<c bYghmUbX`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 gž`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[Ygž`UfhUbX`XYg][b`dfc`YWgž`Ug`k Y`Ug
dfYgYbhU]cbg`k \YfY`gca YcbY`dfYgYbh]g`UbchYf`g`]XYUg`cf`k cfXg`k]h`ci hW`YX]h`

hUddfcdf]UHY`dUfUd`fUg]b[.`7`Ub[]b[`U`ZYk `k cfXg`UbX`d`fUgYg`k \]Y`a cghmifYU]b]b[`hY`cf][]bU`
ghfi W`i fY`UbX`#`f`dfc[fYgg]cb`cZ]XYUg`cZ`hY`cf][]bU`ž`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 hW`YX]h`UbX`hc
d]YW]b[`hc[YhYf`ei chYg`UbX`dUfUd`fUgYg`]bhc`U`bYk `k \c`Yž`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`XUHYž`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'Y'f'g'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'f'i \]X'Y'g'' \]V'f'U'f'm'i b'gk "Y'X'i "U'i #' \]g'Y'# \]V'c'i h' \]g'Y](#)

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`midc`]WYg/

