



ARTS3482

DfcZYgg]cbU`': fYbWk '5

HYfa `C.bY`'#`&\$%-

7 ci fgY'8YHJ]`g

7 fYX]hDc]bhr`*`

Gi a a UfmcZ\hY'7 ci fgY

H\Y': fYbW\!gdYU_]b[`k cfX'fYdfYgYbhr'cbY'cZ\hY'V][[Ygh`]b[i]gh]WncbYg]b'h\Y'k cfX'k]h`Ub`Ygh]a UH\X &+('a]`]cb': fYbW\!gdYU_]f'g'cb'U`Z] Y'W`b]b]Ybhr'"`-`di fgi]b[`mci f'gh XmcZ\hY'`Ub[i U[Y`z`mci `UFY `c]b]b[`U'f]W\z]]VfUbh]UbX`X]j YfgY'W`a a i b]hmcZ\WcgY'hc'(- 'a]`]cb`"YUfbYfg'k cfXk]XY""H\]g'W`ei fgY'k]` VY'dYfZYW`Zcf'mci `]Zmci `U'fYUXm`Uj Y'U'gca Yk \UhdfcZ]WYbh_bck `YX[Y'cZ: fYbW`fYei]j U'Ybhrc`g] gYa YghYfg'cZgh Xnr]b[`Uhi b]j Yfg]m`Yj Y'U'UbX'UFY`cc_]b[`Zcf'Ub`]b!XYd\h`YI hYbg]cb'cZU`g_]`g.`mci `k]`]a dfcj Y`mci f`]ghYb]b[`g_]`g`VmhfU]b]b[`k]h`fUX]c`YI Wfdhrz`mci `k]`fYUX'gca Y'Z]W]cb`Ug'k Y`"Ug`"YUfb`hc gmb\hYh]nY`hY] hg`Zca `j Uf]ci g'a YX]U'UbX`X]gW`gg`W`fYbhYj Ybhr'UbX`W`cgg!W`h`fU`]ggi Yg`fY`Yj Ubhrc`hY : fYbW\!gdYU_]b[`W`a a i b]h]Yg"

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

%` I` bXYfgh]UbX'h\Y'a U]b`]XYUg'cZ\W`a d`YI`hY] hg`fk]hYb'cf'gdc_YbE'cb`Vch`W`bWYhY`UbX`UVghfUW`h`cd]Wg`"
&" A`UbU[Y`]bhYfUW]cbg`fY"["`]bhYffi dh]b[z`W\Ub[]b[`hcd]M`fYgi`a`]b[`cf`W`b]b]i]b[z`WUf]Zm]b[a`YUb]b[E'cb`U'k]XY`fUb[Y'cZgi`V`Y`Wg`"
'` " DfcXi`W`WYUfz`XYH]YX'k]hYb'cf'gdc_Yb`X]gW`gg]cbg'cb`U'k]XY`fUb[Y'cZgi`V`Y`Wg`UbX`YI`d`U]b`U` j`]Yk`dc]bhYZY`W]j`Y`m`
(` GY`Za`cb]rcf`YUfb]b[`dfc[fYgg`UbX`]XYbh]ZnUFYUg`]b`bYX`cZ]a`dfcj`Ya`YbhUbX`#cf`fYj`Yk`"

HYUW\]b[`GhfUH[]Yg`

H\Y`W`ei fgY`]g`VUgYX`cb`h\Y`df]bW]d`Y`h`Uh`Ub[i U[Y`UbX`W`h`fY`UFY`]bhf]bg]WU`m`]b_YX`UbX`Zcfa`U`gcW]U` gmghYa`z`h`YfY`ZcfY`Ub[i U[Yg`UbX`W`h`fYg`UFY`YUfbha`cfY`YZY`W]j`Y`mk`\Yb`gh`XYbhr'\Uj`Y`h\Y`cddcfh`b]m`hc`i`gY`h\Y`"Ub[i U[Y`]b`W`b]hY`h`H\]g`]g`UW\]Yj`YX`]b`WUgg`h`fci`[\`W`"UVcfU]h]`Y`d`YfY`]bhYfUW]cb`UbX`]bW]g]j`Y`hYUW\]b[`ghfUH[]YgZ`U`gi`ddcfh`X`VmU`j`Uf]YhmcZUi`h\Ybh]W`XcW`a`Ybhrz`hc[Y`hYf'k`]h`cb!`]bY`a`UHf]U`g`UbX`UW]j`]h]Yg`" `-`UXX]h]cbz`h\Y`hYUW\Yf'k]`YbXYU]ci`f`hc`Xfuk`cb`mci`f`dYfgcbU`YI`dYf]YbW]g`]b`U`W]a`UH`cZa`i`h`U`fYgdYW`hVYh`k`YYb`U`"dUfh]W]dUbhg`z`k`]h`h\Y`U]a`cZa`U_]b[`h\Y`"YUfb]b[`YI`dYf]YbW`a`cfY`fY`Yj`Ubh`z`UbX`Yb[U[]b["

H\Y`"Ub[i U[Y'cZ]bg]hfi`W]cbz`UggYgga`YbhUbX`[YbYfU`W`a a i b]W]h]cb`]g': fYbW\`"

H\Y`"YW`h`fYg`UFY`h]i`[\h]b': fYbW\`]b`cfXYf`hc`Z`f`h\Yf`XYj`Y`cd`mci`f`]ghYb]b[`W`a`dfY\Ybg]cb`g_]`g`"H\Y`ZcW`g`]g`cb`"Ub[i U[Y`UbX`[fUa`a`Uf`Vi`hW`h`fU`"hcd]Wg`UFY`U`gc`]bW]i`YX`"; fUa`a`Uf`]g`YI`d`U]bYX`k`]h`]b`h\Y`W`b]hY]hcZ\hY`h\Ya`Uh]W`b]b]Ybhr`W`c]YfYX`Vm`h\Y`dfc[fUa`"Hc`Yb\UbW`mci`f`YUfb]b[`YI`dYf]YbW`z`U`"Y`W`h`fYg`k`]`VY`dYfYfY`W`c`f`YX`cb!`]bY`UbX`UW]W]gg]V`Y`Uh`YUgh`&`XUmg`]b`UXj`UbW`/h\Y`mk`]`VY`Ufh]W`UH\X`Ufci`bX`h\Y`d`]cgc`d`hmcZ\hY`Z]ddYX`WUggf`c`ca` . FZWX]bbW`U`Seeda`_`V`W`Ud]T`W`S`d`h`W`S`^`a`X`f`d`S`V`[f`a`S`^`f`S`U`Z`[`Y`i`Z`W`d`W`ef`g`V`W`fe`YS`[`X`d`e`f`W`j`b`a`e`g`d`W`f`a``W`_`S`f`M`[S`^`a`g`f`e`[V`W`a`X`U`S`e`e`l`g`e`g`S`^`k`h`[S`d`M`S`V`[`Y`ad`W`U`f`g`d`W`h`[V`W`a`e`l`S``V`f`Z`W`_`U`S`e`e`f`_`W`[e`g`e`W`fa`Va`f`Z`W`Z`S`d`/W`d`i`ad`]a`X`S`e`e`_`[S`f`[`Y`f`Z`S`f`]`ai`^`W`Y`W`f`Z`d`g`Y`Z`e`f`d`S`f`W`[W`e`g`U`Z`S`e`b`d`T`W`_`ea`h`[`Y`I`V`[e`U`g`ee`[a`ad`V`W`T`S`f`W`e`z`f`U`UbX`Y`f`V`]h`i`b`]`Y`f`g`]m`z`7`Y`b`h`Y`Zc`f`HYUW\]b[E`"

H\Y`h`hc`f]U`g`k`]`[]j`Y`mci`h\Y`cddcfh`b]m]hrc`XYj`Y`cd`mci`f`]bhYfUW]j`Y`g_]`g`UbX`hc`i`gY`h\Y': fYbW\`"Ub[i U[Y`]b`W`b]hY]h`h`fci`[\`ga`U`"["fci`d`k`cf`"HYUW\]b[]g`W`bXi`W`YX`]b`"Ub[i U[Y`#`W`a`di`hY`"UVcfU`hcf]Yg`h`Uh`U`ck`Zc`f`]ghYb]b[z`fY`W`c`f`X]b[z`j`]Yk`]b[`j`]XYc`a`UHf]U`g`UbX`i`g]b[`-`hY`fb`Y`h`fY`gci`f`W`g`"5`j`Uf]YhmcZ`

Ubi U[Y' hUg_g] b' U''g_]`g' UfY' ja d'Ya YbHYX' Vmia YUbg' cZ h.]g' h'WX bc' c [m'

H\YfY']g' U'gc' U'dfc [fUa ' cZW' a d'Ya YbHfmk YY _mi hUg_g' h' VY' XcbY' ci hg] XY' WUggYg' h'Uhk]''VY' dUfhcZ
mci f''YUfb] b['dcfhz']c'' #ik]'']bWYUgY' mci f' fY [i 'Uf' W' b' h' U' W' h' k] h' h' Y' 'Ub [i U [Y' UbX' Z' f' h' Y' f' XYj Y' cd' mci f
g_]`g'' #ik]'' U'gc' \Y' d' mci ' f' YZYW' h' c' b' mci f' 'YUfb] b['YI dYf] YbW' UbX' \Y' d' mci ' XYh' fa] bY' h' Y' VY' h' Y' f
gfU h' Y [] Yg' h' c'] a' d'fcj Y' mci f' g_]`g''

Mci 'UfY' YI dYW' h' X' h' c.

c' k UH WX' h' Y' [fUa a Uf'' YW' h' fYg' c' b! '] bY' UbX' Xc' h' Y' fY' UH YX' 'UW' h' j] h' Yg' VYz' c' fY' W' c' a] b [' h' c' WUgg

c'' UH YbX' h' Y'] b' WUgg' 'YW' h' fYg' h' Uhk]'' VY' i' gYX' Zc' f' k f] h' Y' b' d' fUW' h' W' UbX' YI YfW'] gYg/

c' d' fYdUfY'] b' k' f] h'] b [' Zc' f' h' Y' h' h' c' f] U' g' f' d' fYdUfU' h' c' b' g' a' Um] b' W' h' XY. ''] g' h' Y' b] b [' UbX' fYUX] b [' a' UH' f] U' g' Z' c' a' h' Y
h' I' h' c' c_ ' c' f' c' b'] b' Y' z' k' f] h'] b [' fYgYUfW' h' fYdc' f' g' z' k' UH WX] b [' j] X' Y' c' XcW' a' Yb' h' g' t' /

c' fYj] gY' h' Y' W' c' b' h' Y' b' h' g' c' Z' d' fYj] c' i' g' ' YW' h' fYg' UbX' h' h' c' f] U' g' UbX' k' c' f_ ' c' b' mci f' 'YUfb] b ['dcfhz'] c' fY [i 'Uf' m] b
c' fX' Y' f' h' c'] X' Y' b' h'] Z' n' U' f' Y' U' g'] b' b' Y' Y' X' c' Z] a' d'fcj Ya Yb' h' UbX' #c' f' fYj] Yk "

c''''gdYU_ : fYbW' h' U' h' U'' h] a Yg°

5ggYgga Ybh

5bmifUj Y`UffUb[Ya Ybhg'a UXY`df]cf'cf'UZf'f'Y`di V`]WU]cb'cZ\]g`Wci fgY'cj Yfj]Yk`UfY`bchWcbg]XYfYX`U
j`U]X`fYUgcb`hc`fYgWXYXi`Y`UggYgga Ybh`

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y`8UH`	Gh XYbh@YUfb]b[Ci hWca Yg`5ggYggYX
@YUfb]b[`dcfZc`]c`	` \$i	K YY_`mgi Va]gg]cb`Vm A cbXUm%&`da`cZ\Y Zc``ck]b[`k YY_`"	%Z ž{

	Hcd]W	K]`hY [Ud`vYh YYb`f]W / `dccc]bWYUgY3 .
K YY_*.) `A UfW ! " % A UfW	5ggYgga Ybh	@YUfb]b[`Dcfh`c`W`a dcbYbh.) `h`gi Va]h]b A ccX`Y`VmA cbXUm%&`da " : 998657? `CB`DCFH: C @€ `7CA D@9H€B fK 99?G`(`!*Ł
	Hcd]W	7ccdYfU]cb. bYk `zfa g`cZgcWU`]bHfUW]cb`VUgYX cb]j`c`i bHfuk cf_žVUfYfzYfW K \Uhk ci `X`k`Y`W`ccgY`zcf`ci fgY`j`Yg3<ck`WUb`k`Y Z`Z`ci`f`j`Yg`UbX`W`bhf]Vi`h`h`h`Y`W`a`a`i`b]mB
K YY_+. %`5df]`!`+`5df]`	5ggYgga Ybh	@YUfb]b[`Dcfh`c`W`a dcbYbh. * `h`gi Va]h]b A ccX`Y`VmA cbXUm%&`da "
	Hcd]W	H\Y`W`U`Yb[Yg`cZci`f`k`cfX. XYHfa]b]b[`k`h`h`Y WUgg`h`Y`a`cghdfYgg]b[`W`U`Yb[Yg`f`h`Y Ybj`]f`c`b`a`Y`b`z`]b`Yei`U`]mž]b`h`c`Y`f`U`b`W`z`\`Y`U`h`/ bi`f]h]cbž`Y`h`W`Ł3
K YY_., ; `5df]`!`%(`5df]`	5ggYgga Ybh	@YUfb]b[`Dcfh`c`W`a dcbYbh. + `h`gi Va]h]b A ccX`Y`VmA cbXUm%&`da " DF 9D5F 98`8965H9`B`7`@5GG`fI`@A`98`B HI`HC`F`5`@`#`DF`9D5F`98`F`9G95F`7<`HC`<5B8 B"
	Hcd]W	9I`d`cfU]cb`c`Z`W`U`Yb[Yg`W`cgYb`Vm`h`Y`WUgg"
K YY_-. %) `5df]`!`&% 5df]`	5ggYgga Ybh	@YUfb]b[`Dcfh`c`W`a dcbYbh. , `h`gi Va]h]b A ccX`Y`VmA cbXUm%&`da " 9I`d`cfU]cb`c`Z`W`U`Yb[Yg`W`cgYb`Vm`h`Y`WUgg"
	Hcd]W	9I`d`cfU]cb`c`Z`W`U`Yb[Yg`W`cgYb`Vm`h`Y`WUgg"
K YY_%. &&`5df]`!`&, 5df]`	5ggYgga Ybh	@YUfb]b[`Dcfh`c`W`a dcbYbh. - `h`gi Va]h]b A ccX`Y`VmA cbXUm%&`da " H\Yf`k`j`vY`bc`Y`W`h`f`Y`h`]g`k`YY`_`Xi`Y`h`di`V`]W \`c`]XUm`]h`k`j`vY`f`Yg`W`Y`Xi`Y`h`c`K`YY`_%`ž`Hi`Yg`X`U`m` (`!`*`da`]b`A`U`h`Y`k`g`%`\$`"Hi`h`c`f]U`g`Y`b`X`]b`K`YY`_`-`
	F YUX]b[H\Yf`k`j`vY`bc`Y`W`h`f`Y`h`]g`k`YY`_`Xi`Y`h`di`V`]W \`c`]XUm`]h`k`j`vY`f`Yg`W`Y`Xi`Y`h`c`K`YY`_%`ž`Hi`Yg`X`U`m` (`!`*`da`]b`A`U`h`Y`k`g`%`\$`"Hi`h`c`f]U`g`Y`b`X`]b`K`YY`_`-`
K YY_%%`&-`5df]`!`% A Um	5ggYgga Ybh	@YUfb]b[`Dcfh`c`W`a dcbYbh. %\$`h`gi Va]h]b A ccX`Y`VmA cbXUm%&`da " :]bU`Z`Y`X`V`U`W`_`cb W`a`d`Y`h]cb`c`Z`d`c`f`h`c`]c`k`j`vY`[]j`Yb`cb`]bY`]b

F Ygci fWg

DfYgW]VYX F Ygci fWg

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Hi fb]h]b`Gi Va]gg]cb

≠mci`YbWci bHYf`U`dfcV`Ya`k`Yb`U`HYa`dh]b[`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybh`h`fci`[`\`Hi`fb]h]b`z`d`YUgY`
HY`Yd`cbY`9I`HYfbU`Gi`ddcfhcb`-`,`),`'`,`'`,`%cf`Ya`U]`h`Ya`cb`YI`HYfbU`HY`hgi`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`mY`UfL`≠mci`
UfY`i`bUV`Y`hc`gi`Va`]hmc`i`f`Ugg][`ba`YbhXi`Y`hc`U`ZU`hik`]h`Hi`fb]h]b`mci`a`Um`Udd`mi`Zc`f`Ub`YI`HYbg]cb`z`Vi`hmc`i`
a`i`ghfY`hU]b`mci`f`h]W`Yhbi`a`VYf`Zca`9I`HYfbU`Gi`ddcfhfU`cb[`k`]h`Ubmc`h`Yf`fY`Yj`UbhXcW`a`Yb`hgL`hc`
]bWi`XY`Ug`Yj`]XYbW`hc`gi`ddcfhmc`i`f`YI`HYbg]cb`Udd`]W]h]cb"≠mci`Ya`U]`9I`HYfbU`Gi`ddcfhmc`i`k`]"`

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`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 Yfmc'by']b'h'Y'I BGK 'W'a a i b]m
- 'cW'W'h'g'Y'fj]W'g'UbX'j]b'Z'fa U'h'cb'UV'ci hi BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZ'Y'gY'UfY'Ug'k]''VY'ZJa]]Uf'hc'mci ž'c'h'Y'fg'k]''VY'byk "; U]b]b['U'gc'X'i bXYfghUbx]b['cZU''h'Y fY'U'h'X'UgdY'W'g'cZ9@-G9'k]''\Y'd'mci 'a U_Y'h'Y'a cgh'cZ'mci 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 WXYa]WbZcfa Uhcb`

: cfYggYbhU`ghi XYbh]bZcfa Uhcb`fY`Uh]b[`rc.