



ARTS3574

Hcd]Wg`]b`@Uh]b`5a Yf]Wub`7]bYa U

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

GWXcc``cZ< i a Ub]h]Yg`UbX`@Ub[i U[Yg`##`! BGK ``5ftg`UbX`GcWU``GWYbWg

7 ci fgY`Cj Yfj]Yk

`GHJZ`7 cbhJW`8YHJ`g`

`7cbj Ybcfg`

B Ua Y	9a Uj`	5j Uj`UVj]m	@cWjhcb	D\cbY
B UHj]U`C fhjn 7 YVYf]c	b"cfhjnWVYf]c4 i bgk "YXi "Ui	VmUddc]bha Ybh	A 6&&,	WcbhJW`Vm Ya Uj`

GWXcc``7cbhJW`bZcfa Uh]cb

7ci fgY'8YHJ]`g

7fYX]hDc]bng`*`

Gi a a UfmicZ`h`Y'7ci fgY

Gi V`Y`W`h`5`f`Y`U`.<`j`g`d`U`b`]`W`G`h`X`]`Y`g`H`\\`g`'`W`c`i` fgY`'`W`U`b`'`U`'`g`c`'`V`Y`'`g`h`i`X`]`Y`X`'`]`b`'`h`Y`'`Z`'`c`k`'`]`b`[`'`g`d`Y`W`]`U`]`g`U`h`]`c`b`g`5`a`Y`f`]`W`U`g`G`h`X`]`Y`g`'

H`\\`g`'`W`c`i` fgY`'`Y`I`U`a`]`b`Y`g`'`U`'`f`U`b`[`Y`'`c`Z`g`i`W`W`g`g`Z`'`'`Z`'`a`g`'`Z`f`c`a`'`@`U`h`]`b`'`5`a`Y`f`]`W`U`'`d`f`c`X`i`W`X`'`d`c`g`h`&`\$`\$`\$`'`V`m`U`'`b`Y`k`[`Y`b`Y`f`U`h`]`c`b`'`c`Z`Z`'`a`a`U`_`Y`f`g`'`V`c`f`b`'`U`Z`Y`f`%`-`*`\$`"'`h`i`Y`I`U`a`]`b`Y`g`'`h`Y`'`b`Y`k`'`h`f`Y`b`X`g`'`]`b`'`A`Y`I`]`W`U`b`z`'`6`f`U`n`]`]`U`b`z`'`5`f`[`Y`b`h`]`b`]`U`b`z`'`U`b`X`'`D`Y`f`i`j`]`U`b`'`W`]`b`Y`a`U`h`c`[`f`U`d`\\`m`f`Z`'`a`g`'`U`b`X`'`W`c`i`b`f`]`Y`g`j`U`f`m`Z`f`c`a`'`m`Y`U`f`'`h`c`'`m`Y`U`f`'`U`b`X`'`a`U`m`]`b`W`i`X`Y`'`Z`'`a`g`'`g`i`V`X`'`U`g`'`3`_`a`d`W`e`b`W`d`d`e`l`5`[`f`k`a`X`9`a`V`i`B`S`'`i`e`>`S`T`k`d`'`f`Z`i`?`a`f`a`d`U`k`U`W`6`[`S`d`W`e`l`F`Z`W`E`W`U`d`W`f`[`F`Z`W`[`d`7`k`W`e`z`?`S`V`W`[`g`e`S`E`" `h`i`U`'`g`c`'`W`c`b`g`]`X`Y`f`g`'`X`]`Z`Y`f`Y`b`W`g`'`V`Y`h`k`Y`Y`b`'`W`c`b`h`Y`a`d`c`f`U`f`m`Z`'`a`'`d`f`c`X`i`W`]`c`b`'`U`b`X`'`h`Y`'`U`Y`g`h`Y`h`]`W`g`'`U`b`X`'`d`c`'`]`h`W`g`'`c`Z`h`Y`@`U`h`]`b`'`5`a`Y`f`]`W`U`b`'`W`]`b`Y`a`U`'`c`Z`h`Y`%`-`*`\$`g`!`%`-`,\$`g`" `h`Y`Y`'`Z`'`a`g`'`U`f`Y`'`g`h`i`X`]`Y`X`'`]`b`'`h`Y`]`f`'`d`c`'`]`h`W`U`z`'`g`c`W`]`U`'`U`b`X`'`W`'`h`i`f`U`'`W`c`b`h`Y`I`h`'

7ci fgY`@`Y`U`f`b`]`b`[`'`C`i`h`W`c`a`Y`g`

%`-`h`Y`b`h`]`z`h`i`h`Y`'`g`c`W`]`U`z`'`Y`W`c`b`c`a`]`W`c`'`U`b`X`'`d`c`'`]`h`W`U`'`W`c`b`h`Y`I`h`c`Z`@`U`h`]`b`f`c`E`'`5`a`Y`f`]`W`U`b`'`W`]`b`Y`a`U`&`" `8`]`g`W`g`g`@`U`h`]`b`'`5`a`Y`f`]`W`U`b`'`Z`'`a`g`'`V`c`h`'`]`b`'`h`Y`f`a`g`'`c`Z`h`Y`I`h`i`U`'`U`b`X`'`j`]`g`i`U`'`U`b`U`'`m`g`Y`g`'`" `8`]`g`W`g`g`'`h`Y`'`X`]`Z`Y`f`Y`b`W`g`'`V`Y`h`k`Y`Y`b`'`h`Y`'`b`Y`k`'`h`f`Y`b`X`g`'`]`b`'`@`U`h`]`b`'`5`a`Y`f`]`W`U`b`'`W`]`b`Y`a`U`'`U`b`X`'`h`Y`'`U`Y`g`h`Y`h`]`W`g`'`U`b`X`'`d`c`'`]`h`W`g`'`c`Z`h`Y`'`@`U`h`]`b`'`5`a`Y`f`]`W`U`b`'`B`Y`k`'`7`]`b`Y`a`U`#`\\`f`X`'`7`]`b`Y`a`U`'`c`Z`%`-`*`\$`g`!`%`-`,\$`g`(" `9`i`d`'`U`]`b`'`h`Y`'`]`a`d`U`W`g`'`c`Z`[`'`c`V`U`]`n`U`h`]`c`b`'`U`b`X`'`d`f`]`U`h`]`n`U`h`]`c`b`'`c`Z`@`U`h`]`b`'`5`a`Y`f`]`W`U`b`'`W`]`b`Y`a`U`h`c`[`f`U`d`\\`m`

HYUWX`]`b`[`'`G`h`f`U`H`Y`[`]`Y`g`'`

H`\\`Y`'`h`Y`U`W`X`]`b`[`'`d`\\`'`c`g`c`d`\\`m`i`c`Z`h`]`g`'`W`c`i` fgY`'`]`g`'`]`b`Z`f`a`Y`X`'`V`m`h`Y`'`I`B`G`K`'`;`i`]`X`Y`'`]`b`Y`g`'`c`b`'`@`Y`U`f`b`]`b`[`'`z`'`U`b`X`'`W`U`b`'`V`Y`g`i`a`a`U`f`]`n`Y`X`'`U`g`'`9`b`[`U`[`Y`a`Y`b`h`z`'`7`c`b`h`Y`I`h`i`U`]`n`U`h`]`c`b`'`U`b`X`'`h`b`W`i`g`]`Y`b`Y`g`g`'`f`g`Y`Y`'`[k`k`k`\["`i` \]`X`Y`'`\]`b`Y`g`c`b`'`Y`U`f`b`\]`b`\[`'`i`b`g`k`"Y`X`i`"U`i`E`" `h`Y`'`Y`W`h`'`f`Y`f`\]`b`'`W`X`U`f`\[`Y`'`g`Y`Y`_`g`'`h`c`'`d`f`c`j` \]`X`Y`'`U`'`j`Y`b`i`Y`'`Z`c`f`'`h`c`g`Y`'`h`f`Y`Y`_`Y`m`i`d`c`\]`b`h`g`z`'`U`b`X`'`h`Y`f`Y`Z`c`f`Y`'`Y`a`d`\\`U`g`\]`n`Y`g`'`h`U`h`h`Y`'`U`f`\[`Y`f`'`c`V`'`Y`W`\]`j`Y`'`\]`g`'`h`c`'`h`Y`U`W`X`'`g`h`i`X`Y`b`h`g`'`\\`c`k`'`h`c`'`V`Y`W`c`a`Y`'`W`\]`h`W`U`'`'`Y`U`f`b`Y`f`g`"](#)

H`\\`g`'`W`c`i` fgY`'`i`g`Y`g`'`U`'`V`'`Y`b`X`Y`X`'`U`d`d`f`c`U`W`X`'`c`Z`@`Y`W`i`'`f`Y`g`'`U`b`X`'`H`i`h`c`f`]`U`g`z`c`f`[`U`b`]`n`Y`X`'`U`f`c`i`b`X`'_`Y`m`f`Y`U`X`]`b`[`g`'`U`g`'`W`c`b`h`U`]`b`Y`X`'`]`b`'`h`Y`'`7`ci` fgY`'`F`Y`U`X`Y`f`"

5`" `Y`W`h`'`f`Y`'`Y`U`W`X`'`k`Y`Y`_`k`]`" `U`X`X`f`Y`g`g`'`h`c`d`]`W`g`'`U`X`X`f`Y`g`g`Y`X`'`]`b`'`h`Y`'`Z`'`a`'`J`Y`k`]`b`[`'`;`i`]`X`Y`g`'`U`b`X`'`F`Y`U`X`]`b`[`g`" `A`U`'`c`f`]`m`c`Z`h`Y`'`k`c`f`_`]`b`'`h`Y`'`W`c`i` fgY`z`'`\\`c`k`Y`j`Y`f`z`k`]`" `c`V`W`'`f`X`i`f`]`b`[`'`h`Y`'`h`i`h`c`f`]`U`g`"

5ggYgga Ybh

8i f]b['h.j'WŁi fgYžX]ZYfYbh@Uq̄b'5a Yf]WUbb'Z]a g'k]'VY'X]gW ggYX'k]h'U'fUb[Y'cZ[YbfYg'UbX'Łcd]Wg
]bWi X]b[žVi hbch'`a]hX'ŁčžYI]Yž'a][fUq̄cbž]bX][YbcI g'hYa Yg'UbX'gi V'YWgž[YbXYf'fYdfYgYbhUq̄cbž
]XYbh]mžcfa Uq̄cbžj]c'YbWž'WŁ'cb]nUq̄cb'UbX'W' h'fU'Uddfcdf]Uq̄cb''H\Y'Z]a g'gY'YWYX'Zcf'h.j'WUgg'UfY

8YHU]g. %) !a]bi h' dfYgYbHU]cb'cb'U'gY'YWWX'Z'a "K f]hYb'ZYXVUW_ž'd'i g'U'bi a Yf]WU' [fUXY'Zca]bghf Wcf f&) i Ǝ'UbX'dYYf'fYj]Yk 'f) i Ǝ'

5XX]h]cbU'XYHU]g.

5ggYgga Ybh8YgW]dh]cb. 'Gh XYbhtg'k]' []j Y'U'g\cfhZcfa U'dfYgYbHU]cb'cb'U'gY'YWWX'@UH]b'5a Yf]WU]b Z'a "H\Y'Z'a 'bYYXg'hc'VY'WcbhYI h' U']hYX'UbX'gh' XYbhtg'k]' []j Y'gca Y'VUW_[fci bX'cb'_Ym]ggi Yg"H\Y dfYgYbHU]cb'k]'VY'a UXY'jb'k cf_]b[' [fci dg'cZ&'cf' 'i b'Ygg'U'gh' XYbh\Ug'ghfcb['↑ gh]ZWH]cb'Zcf i bXYftU_]b['h'Y'fUg_]bX]j]Xi U'm'H\Y'Yb[h'cZ'h'Y' dfYgYbHU]cb'g') 'a]bi h'g'Zcf'YUW' dfYgYbhfz'd'i g'Z] Y hc'h'b'a]bi h'g'cZ'WUgg'X]gW'gg]cb" Mci 'k]'hU'_žBC'HF'958"

Ǝ'UXX]h]cb'hc'a U_]b['h'Y']b!WUgg'dfYgYbHU]cbž'YUW'gh' XYbh'k]'gi Va]h'Ub'UbbchUH'X'V]V']c[fUd\m f%\$\$\$'k cfXgžk \]W'k]'XYU'k]h'U'a]b]a i a 'cZ) 'UWUXYa]Wgci fWg'g' gYX']b'h'Y'fYgYUfW'YUX]b['hc h'Y' dfYgYbHU]cb": cf'YUW'cZ'h'YgY'fY'Z'fYbW'gž'h'Y'gh' XYbh'k]'Vf]YZmci h]bY. 'UƎ'Zca 'k \YfY'h'Y'h'Y' h'k Ug gci fW'X/VƎ'k \m]h]g'ja dcfh'Ubh'Zcf'h'Y' h'cd]Wgh' X]YX/WƎ'ck ']hk Ug']bh' [fUH'X']bhc'h'Y' dfYgYbHU]cb" H\Y' UbbchUH'X'V]V']c[fUd\mig\ci 'X'UXXfYgg'UWUXYa]Wgci fWg'cb'mi g]b['<5F J 5F 8'fY'Z'fYbW]b[glmY"

Gh XYbhtg'fYVW]j Y'k f]hYb'UbX']bX]j]Xi U'ZYXVUW_'5b']bX]j]Xi U'a Uf'_Zca 'h'Y'YWi' fYf'fk' cft' &) i Ǝ'UbX'U

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

K YY_mUWXYa]WUfh]WYg`UbX`a cj]Yg`k]`VY`i d`cUXYX`]bhc`A ccX`Y

F YWca a YbXYX`F Ygci fWg

: cf`UXX]hcbU`V]V`c[fUd`mifY`Yj Ubhlc`h`Y`Z]a g#cd]Wg`gh X]YX`Wcbgi`hX]ZYfYbhXUhUVUgYg`dYfh]bYbhlc
:]a`gh X]Yg`UbX`@Uh]b`5a Yf]WUb`Gh X]Yg`fgi`W`Ug`A @5žcf`<5D`€"

Mci`k]`U`gc`Z]bX`U`k YU`h`cZ]bZcfa Uh]cb`cb`; cc[`Y`GWc`Uf"

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

7ci fgYg`UfY`dYf]cX]WU`mifYj]Yk YX`UbX`gh XYbhg`ZYXVUW`]g`i gYX`hc`]a dfcj Y`h`Ya "`: YXVUW`]g
[UhYfYX`i g]b[`j Uf]ci g`a YUbg`]bW`X]b[`I BGK `g`7ci fgY`UbX`HYUW]b[`9j U`i Uh]cb`A m9l dYf]YbW"

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Hi fb]hb`Gi Va]gg]cb

Ʒmci`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`"Ʒmci`
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`mc`i`a`Um`Udd`m`Z`f`Ub`YI`H`f`bg]cb`z`Vi`hmc`i`
a`i`gh`f`Y`h]b`mc`i`f`h]W`Y`h`bi`a`VY`f`Z`ca`9I`H`f`b`U`Gi`ddcfh`f`U`cb[`k`]h`Ub`mc`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`mc`i`f`YI`H`f`bg]cb`Udd`]W`h]cb"Ʒmci`Ya`U]`9I`H`f`b`U`Gi`ddcfh`mc`i`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`mc`i`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`Y`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`ch`id`c`g`g]V`Y`z`]h`k`]`V`Y`g`h`U`H`X`i`cb`mc`i`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`#`gh`X`Y`bh`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 hWYX]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 hWYX]hU`bX`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 bXYfghUjX'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'UjX'5W'W'dhUV'Y'I gY'cZ
I BGK '⇒H'F'Ygci f'W'g'Dc'W'h
- VY'Uk UfY'cZ'Y'ghUjX'UfX'g'cZVY\Uj]ci f'YI dY'W'X'cZYj Yfmc'bY'j'b'h'Y'I BGK 'W'a a i b]m
- 'cW'U'Y'gY'fj]W'g'UbX'j'bZ'c'fa U'h'c'b'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 bXYfghUjX]b['cZU''h'Y
fY'U'Y'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'c'.'#j' V'Y'W'f' i \]X'Y'g'' \]V'f'U'f'm'i b'g'k "Y'X'i "U'i #' \]g'Y'#U'V'c'i h'Y' \]g'Y](#)

