



ARTS2815

Dc`j]h]Vg`UbX`GYW f]hm]b`h\Y`ϕXc!DUW]Z]W

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

7ci fgY`Cj Yfj]Yk

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7 ci fgY'8YHJ]g

7 fYX]hDc]bqg '*

Gi a a UfmicZ\hY'7 ci fgY

H\Y' bXc!DUWZ]W]g U'bYk' UbX'XmbUa]WfY[]cbžcbY'hUhdcgYg]g[b]Z]W]bhWXU''Yb[Yg'UbX'cddcfi b]hYg"
b'h]g'Wci fgYžmci 'k]''YI d'cfY'hY'WcbW'dhcZ\hY' bXc!DUWZ]W]Ug'U'Wc\YfYbhfY[]cbU'Wcbgfi WžcbY'hU
fYZYVWg'hY']bWYUg]b[]bhYfUW]cb'UbX'WcbbYW]j]mVYh YYb'hY'5g]U!DUWZ]W]UbX'hY' bX]Ub'C W]Ub
fY[]cbg''H\Y'WcbW'dhcZ\hY' bXc!DUWZ]W]g'WcbhYghYXž'UbX'mci 'k]''YI Ua]bY'X]ZYfYbhWcbW'dh]cbg'cZ\hY
bXc!DUWZ]W]UbX'k \YfY]hY'fY[]cbU'Vci bXUf]Yg''Y'' bXc]b[]gcžmci 'k]''U'gc'Wcbg]XYf'X]ZYfYbh
UddfcUWX'Yg'hc'fY[]cbg'UbX'fY[]cbU']ga ž'UbX'hY'dfcV'Ya g'UbX'dfcgdYWg'hYfY]b''H\Y'Wci fgY'k]''U'gc
]bfcXi W'mci 'hc'hY'g[]b]Z]W]bhdc']h]W]ž'gfU]hY[]W]UbX'YWcbca]W]ggi Yg'hU'hY'fY[]cb'dcgYg'UbX'hY
ZcfY][b'dc']W]Yg'cZa U'cf'fY[]cbU'UW'c'fgž']bW] X]b[] bX]Už'7 \]bUž'hY'I Gž>UdUb'UbX'5i ghfU']U''H\YgY
]ggi Yg'UbX'WXU''Yb[Yg'UfY'Vch']bhYfg]hY'UbX'fU]bgbU]cbU'']b' bU]h' fYž'UbX']bW] XY'ghfU]hY[]W]f]j U'f]m]UbX
Wca dY]h]cb'VYh YYb'a U'cf'fY[]cbU'UW'c'fgž'Wci bhYf]d]fU]W]ž'a Uf]h]a Y'gi fj Y]'UbWž'UbX'fU]X''

7 ci fgY'@YUfb]b['Ci hWca Yg

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hY'WcbW'dhcZ\hY' bXc!DUWZ]W]
&" Ci h]bY'g[]b]Z]W]bhWcbhYa dcfUfm]ggi Yg'UbX'WXU''Yb[Yg']b'hY' bXc!DUWZ]W]
' " 9j U'i U]h'hY'gWc'U'f'm']hY'fU]h' fY'cb' _Ym]ggi Yg'UbX'WXU''Yb[Yg']b'hY' bXc!DUWZ]W]
(" 7cbXi W]h]bXYdYbXYbhUbX'gWc'U'f'mfYgYU'fW]
)" 7cbgfi W]h]Ub'Yj]XYbW]!VUgYX'Uf[i a YbhVch'cfU''m]UbX']b'k'f]h]b["

HYUWX]b['GhfU]hY[]Yg'

H\Y'Wci fgY'YI d'cfYg'hY'XYj Y'cda Ybhg]b'hY'Yj'c'j]b[] bXc!DUWZ]W]fY[]cb'h'fci [\ 'hY''Ybg'cZ\hY
UWX]Ya]WX]g]W]d']bY'cZ']bhYfbU]cbU'fY'U]h]cbg'' h]VY[]bg'k]h'hY'WcbW'dh' U]gU]h]cb'cZU''fY[]cb''UbX'hY'Yb
ZcW'gYg'cb'hY']bhYfg]hY'XmbUa]W]g'Zca 'hY''Yj Y'g'cZVch' ['cVU'UbX'fY[]cbU' [Ycdc']h]W] "H\Y'Wci fgY']g
]g'hU] [\h'h'fci [\ 'U'&! \ci f''YW]h' fY'UbX'U' % \ci f'hi'hc'f]U''H\Y''YW]h' fYg'dfcj]XY'VUW] [fci bX'a U]h]f]U'UbX
UbU'mgYg'XfUk b'Zca 'hY'YI dY]h]gY'cZ\hY''YW]h' fYf'UbX'Zca 'hY'fY'Yj UbhUWX]Ya]W]h]fU]h'fY''H\Y' % \ci f
h'hc'f]U'k]''VY''YX'Vm]g'c' Y''Y]U %o %o %o

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7`Ugg`ZJW`]HU]cb`	&)	Bch5dd`]WUV`Y	&ž' ž)
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%!%) `a]b`WUgg`ZJW`]HU]cb`VUgYX`cb`Ugg][bYX`fYUX]b[g`]b[fci dg`cZ' !(`gh XYb]g`Zc`ck YX`VmX]gW gg]cb"
5`gh XYb]g`k]`fYW]j Y`h`Y`gUa Y`a`Uf`_`

Gh XYb]g`k]`fYW]j Y`k f]h]b`ZYXVUW`k]h]b`%\$`k`cf_]b[`XUmg`cZ`h`Y]f`ZJW`]HU]cb`"

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

Mci`UFY`fYei]fYX`hc`gYfj Y`Ug`"VX]YZX]gW`ggUbhg`"cZ`h`Y`fYUX]b[g`]b`h`Y`gYa]bUf`Uh`YUgh]cbW`Xi`f]b[`h`Y`
Wci`fgY`"8YdYbX]b[`cb`h`Y`g]nY`cZ`h`Y`WUggZ`YUW`k`YY`_`h`fY`cf`Zci`f`gh`XYb]g`k`]`k`cf`_`Ug`U`h`Y`Ua`UbX`
`YUX`cZ`h`Y`X]gW`gg]cb`"H`Y`dfYgYb]h]fg`a`i`gha`U`_`U`%)!&\$`a`]b`dfYgYb]h]cb`cZ`h`Y`k`YY`_`g`fYUX]b[g`UbX`
ZJW`]HU]`X]gW`gg]cb`"F`U`h`Y`f`h`Ub`g]a`d`mgi`a`a`Uf]n]b[`h`Y`fYUX]b[g`i`bXYf`ei`Ygh]cb`f]fYgi`a`UV`mU`
k`]`_`Uj`Y`fYUX`]h`Z`h`Y`X]gW`gg]cb`ZJW`]HU]`hc`fg`g`l`ci`X`W`f]h]W`mYb[U[Y`k`]h`h`Y`a`U`h`f]U`UbX`h`Y`UgY`
ci`hgdYV]ZWei`Ygh]cbg`cf`dfcV`Ya`g`h`U`h`UddYUf`k`cf`h`mcZ`U`h`Y`b]h]cb`UbX`WUb`VY`U`VUg]g`Zc`f`
X]gW`gg]cb`"5`gh`XYb]g`]b`U[fci`d`XY`Y[U`h`X`k`]h`h`Y`fYgdcbg]V`]h]mhc`YUX`h`Y`X]gW`gg]cb`k`]`fYW]j`Y`
h`Y`gUa`Y`a`Uf`_`

Hi`fb]h]b`gYh]b[.`H`g]g`bchU`Hi`fb]h]b`Ugg][`ba`Ybh

5ggYgga Ybh&.`7`f]h]W`F`Yj`]Yk`

GHUfhXUH. `Bch5dd`]WUV`Y

@Yb[`h.`+)`\$`k`cfXg`

8YHU]`g.

H`Y`W`f]h]W`fYj`]Yk`fYei]fYg`gh`XYb]g`hc`gY`Y`W`icbY`U`W`X`Ya`]WUf]h]WY`Zca`U`k`YY`_`fYUX]b[`UbX`
XYa`cbgfU`h`U`W`cgY`Yb[U[Ya`YbhUbX`UbU`mg]g`k`]h`h`Y`a`U]b`Uf[i`a`Yb]g`UbX`WU]a`g`cZ`h`U`h]Uf]h]WY`"H`Y`
k`cfX`Yb[`h`cZ`h`Y`fYj`]Yk`]g`+)`\$`k`cfXg`"

: YYXVUW_ GHi XYbhtg:k]`fYVW]j Y`k f]htYb`ZYXVUW_`UbX`U`bi a Yf]WV`[fUXY`k]h]b`hk c`k YY_g`cZgi Va]gg]cb
h`fci [\ `h`Y`l` b]j Yfg]mfj @YUfb]b[`A UbU[Ya YbhGmg]Ya `f@A GL`

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

Mci `UFY`fYei]fYX`hc`dfYdUFY`U`"fYUW]cb`d]YVW`Z" `k \]VX`g`lci `X`dfYgYbhmc`i f`fYgdcbgY`hc`z`UbX`W]h]ei Y`c`Z
h`Y`a U`cf`Uf[i a Ybhtg`Zca `U`k YY_g`fYUX]b["Mci `WJb`gY`YVh`h`Y`k YY_`c`Zmci f`]bh`fYgh`hc`fYZYVh`cb`z`Vi h
mci f`gY`YVh]cb`g`lci `X`VY`X]ZY`fYbh]Zca `h`Y`k YY_`c`Zmci f`WUgg`ZUW]h]h]cb`f`B`gg][ba Ybh`%`H`H`g`YggUm]g
Xi Y`cb`>i `m`&"Mci `k]`fYVW]j Y`k f]htYb`ZYXVUW_`k]h]b`%\$`k`cf_]b[`XUm]g`H`Y`ZYXVUW_`g`Y`Y`h`fi V`f]Wk]`
VY`Uj`U]UV`Y`hc`gh`XYbhtg`Uh`h`Y`gh]Uf`hc`Z`h`Y`W`ei fgY`gc`h`Uh`h`Y`m`WJb`k`cf_`hc`k`UfXg`gdYVW]ZYX`gh]UbXUfXg"

Hi fb]h]b`gYH]b[. H`H`g`Ugg][ba Ybh]g`gi Va]htYX`h`fci [\ `Hi fb]h]b`UbX`gh`XYbhtg`Xc`b`chgY`Y`Hi fb]h]b
g]a]Uf]mfYdcf]g"

5ggYgga Ybh` . A U`cf`9ggUm

GhUfhXUHY . Bch5dd`]WUV`Y

@Yb[h . `&) \$\$`k`cfXg

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H`Y`YggUm]g`h`Y`Z]bU`UggYgga Ybh`c`Z`h`Y`W`ei fgY"

h`fYei]fYg`gh`XYbhtg`hc`XYa`cbgh]UHY`Yb[U[Ya Ybhk]h`h`Y`W`fY`h`Ya`Yg`UbX`]ggi Yg`fU]gYX`]b`h`Y`W`ei fgY
UbX`h`Y]f`UV]`]m]hc`W`cbg]fi`W`h`U`d`Y`fgi`Ug]j`Y`UbX`k`Y`!`Yj`]X`Y`b`W`X`Uf[i a Ybh`H`Y`k`cfX`Yb[h`c`Z`h`Y`YggUm]g
&) \$\$`k`cfXg"

: YYXVUW_ GHi XYbhtg:k]`fYVW]j Y`k f]htYb`ZYXVUW_`UbX`U`bi a Yf]WV`[fUXY`k]h]b`hk c`k YY_g`cZgi Va]gg]cb
h`fci [\ `h`Y`l` b]j Yfg]mfj @YUfb]b[`A UbU[Ya YbhGmg]Ya `f@A GL`H`Y`ZYXVUW_`g`Y`Y`h`fi V`f]Wk]`VY
Uj`U]UV`Y`hc`gh`XYbhtg`Uh`h`Y`gh]Uf`hc`Z`h`Y`W`ei fgY`gc`h`Uh`h`Y`m`WJb`k`cf_`hc`k`UfXg`gdYVW]ZYX`gh]UbXUfXg"

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

H`H`g`Z]bU`YggUm]WJb`VY`cb`U`hc`d]Wc`Zmci f`]bh`fYgh]Vi`h`VUgYX`cb`cf`fY`UHYX`hc`h`Y`W`b`h`b`h`c`Z`h`Y`W`ei fgY
UbX`#`f`h`hc`f]U`X]gW`gg]cbg`"H`H`g`YggUm]g`h`Y`Z]bU`UggYgga Ybh`Z`f`h`Y`W`ei fgY`"H`fci [`lci`h`h`Y`h`fa`z`mci
g`lci `X`h`]b_`UVci`h`U`hc`d]Wc`Zmci f`]bh`fYgh]UbX`ck`]h`WJb`VY`UbU`m`YX`"H`Y`YggUm]d`f`c`d`c`gU`b`Y`Y`X`g`hc`VY
X]gW`ggYX`k`]h`h`Y`]b`gh]fi`W`c`f`Xi`f]b[`h`Y`c`Z]W`l`ci`fg`c`f`j`]U`Ya`U]"H`Y`Z]bU`YggUm]g`Xi`Y`cb`5`i`[`i`gh
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5 hYbXUbW`F Yei]fYa Ybhg

6 ch`YWhi fYg`UbX`hi hcf]U`g`UFY`a UbXUhcfmWUggYg`]b`5F HG&, %) `]b`H&Z`&\$&\$"

7 ci fgY`GW`YXi `Y

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K YY_%`" %A Um!`(`>i bY	@YWhi fY	Cj Yfj]Yk`/`@c[]gh]Vg`cZ7ci fgY. `Dc`]h]Vg`UbX`GYW`f]hm]b`hY`&Xc!DUW]Z]W`X]ZYfYbh`Yj`Y`g`cZ`UbU`mg]g/a`U`c`f`UW`c`fg`]b`hY`&Xc!DUW]Z]W`fY[]cb""
	Hi hcf]U`	Dc`]h]Vg`UbX`GYW`f]hm]b`hY`&Xc!DUW]Z]W`X]ZYfYbh`Yj`Y`g`cZ`UbU`mg]g/a`U`c`f`UW`c`fg`]b`hY`&Xc!DUW]Z]W`fY[]cb""8]g]f]Vi`h]cb`cZ`hY`d`fY`g`Y`b`h]cb`h`c`d]Vg""
K YY_`&.`+`>i bY`!`%%>i bY	@YWhi fY	H`Y`V`c`b`W`d`h`c`Z`h`Y`&Xc!DUW]Z]W`Xi`ZYfYbh`U`d`d`f`c`U`W`Y`g`h`c`V`c`b`W`d`h`U`]n]b[`U`fY[]cb/W`]h]WU`[`Y`c`d`c`]h]Vg`j`g`"WUgg]WU`[`Y`c`d`c`]h]Vg"
	Hi hcf]U`	

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

5`fY`Yj UbhWci fgY`]bZcfa Uh]cb`UbX`fYei]fYX`fYUX]b[g`UfY`Uj U]`UV`Y`cb`h\Y`A ccX`Y`g]h`Zcf`h`jg`Wci fgY`"
D`YUgY`fY[i`Ufm`WXYW`Zcf`i dXUH`gZ`Ubbci bW`a Yb]gZ`UbX`c`h\Y`f`fY`Yj UbhWci fgY`fY`UH`X`]bZcfa Uh]cb`cb
A ccX`Y`"

F YWca a YbXYX`F Ygci fWg

hZcfa Uh]cb`UVci hUXX]h]cbU`fYUX]b[g`UbX`fYgci fWg`]g`U`gc`a UXY`Uj U]`UV`Y`cb`h\Y`A ccX`Y`g]h`Zcf`h`jg`
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7ci fgY`9j U`i Uh]cb`UbX`8Yj Y`cda Ybh

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≠mci`YbWci bHYf`U`dfcV`Ya`k` \Yb`UHYa` dh]b[`hc`gi`Va`]hmc`i`f`Ugg][`ba`YbhiHfci`[`\`Hi`fb]h]b`z`d`YUgY`
HY`Yd\cbY`9I`HYfbU`Gi`ddcfhcb`-`,`)`"``"``%cf`Ya`Uj`h`Ya`icb`YI`HYfbU`HY`hgi`ddcfh4`i`bgk`"YXi`"Ui`""Gi`ddcfh`
\ci`fg`UfY`,`.\$\$Ua`-`-%\$.\$\$da`icb`k`YY`XUmg`UbX`-`.\$\$Ua`-`).\$\$da`icb`k`YY`YbXg`f1`*)`XUmg`U`mY`Uf2`≠mci`
UfY`i`bUV`Y`hc`gi`Va`]hmc`i`f`Ugg][`ba`YbhiXi`Y`hc`U`Zji`hk`]h`Hi`fb]h]b`mci`a`UmUdd`mZc`f`Ub`YI`HYbg]cb`z`Vi`hmc`i`
a`i`ghfYhU]b`mci`f`h]W`Yhbi`a`VYf`Zca`9I`HYfbU`Gi`ddcfhU`cb[`k`]h`Ubmc`h`Yf`fY`Yj`UbhXcW`a`Ybhtg`L`hc`
]bWi`XY`Ug`Yj`]XYbVW`hc`gi`ddcfhmc`i`f`YI`HYbg]cb`Udd`]W]h]cb`≠mci`Ya`Uj`9I`HYfbU`Gi`ddcfhmc`i`k`]`
Ui`hca`U]WU`mifYW]j`Y`U`h]W`Yhbi`a`VYf`z`Vi`h]Zmci`HY`Yd\cbY`mci`k`]`bYYX`hc`gdYW]Z]WU`mUg`Zc`f`cbY`
Hi`fb]h]b`U`gc`dfcj`]XYgi`dXUH`g`cb`h`Y]f`gmghYa`g`hU`h`g`cb`Hk`]hYf`"

;`YbYfU`mz`UggYgga`YbhiUg_g`a`i`ghVY`gi`Va`]hYX`Y`YWfcb]WU`mj`]U`Y]h`Yf`Hi`fb]h]b`cf`U`A`ccX`Y`
Ugg][`ba`Ybhi`h`]bghU`bVW`g`k`\YfY`h`g`]g`bchdcgg]V`Yz`]hk`]`VY`ghU`h`X`cb`mci`f`Wci`fgY`g`A`ccX`Y`g]h`k`]h`
U`HYfbU]h]`Y`gi`Va`]gg]cb`XYhU]g`"

:`cf]bZcfa`Uh]cb`cb`\ck`hc`gi`Va`]hUgg][`ba`Ybhtg`cb]bY`j`]U`A`ccX`Y`.\`hhdg`#gh`XYbhi`bgk`"YXi`"Ui`Ack`!
gi`Va`]hUgg][`ba`Ybhta`ccX`Y`"

5 WUXYa]W< cbYgmiUbX`D`U[]Uf]ga

D`U[]Uf]ga `]g`i`g]b[`h`Y`k`c`f`X`g`c`f`]X`Y`U`g`c`Z`c`h`Y`f`g`i`U`b`X`d`f`Y`g`Y`b`h]b[`h`Y`a` `U`g`m`c`i`f`c`k`b``#W]b`h]U`_`Y`a`U`b`m`
Z`c`f`a`g`Z`Z`c`a` `X`Y`]V`Y`f`U`h`Y` `W`X`Y`U`h]b[`h`c` `U`W`W`Y`X`Y`b`h]U`m`i`W`c`d`m]b[`Z`c`a` `U`g`c`i`f`W`k`]h`c`i`h`U`W`_`b`c`k` `Y`X[`Y`a` `Y`b`h`

I`B`G`K` `[`f`c`i`d`g`d`U[]Uf]ga `]b`h`c` `h`Y` `Z`c` `c`k`]b[`W`U`h`Y`[`c`f`]Y`g.

- i bXYfgHUbX'mci f'f][\hg'UbX'fYgdcbg]V']hYg'Ug'U'gh XYbhUhl BGK
-

5 WUXYa]WbZcfa Uh]cb

: cf`YggYbh]U`gh XYbh]bZcfa Uh]cb`fY`Uh]b[`tc.

- fYei Ygh]Zcf`YI H`bg]cb/
- `Uh`gi Va]gg]cbg`[i]XY`]bYg/
- fYj]Yk `cZa Uf_g/
- I B GK `<YU`h`UbX`GUZY`midc`]WYg/
- YI Ua]bUh]cb`dfcW`Xi fYg/
- gdYW]U`W`bg]XYfUh]cb`]b`hY`Yj YbhcZ]`bYgg`cf`a]gUXj Ybh fY/
- gh XYbhYei]mUbX`X]gUV`]m/
- UbX`c`hYf`YggYbh]U`UWUXYa]W]bZcfa Uh]cbz`gYY