



ARTS3458

7 \]bYgY '7 Udghc bY. 'F Y!J]g]cb]b['7 \]bU'UbX'7 \]bYgY
Gh X]Yg

HYfa 'H\fYY'##'&\$&\$

7ci fgY`Cj Yfj]Yk

GHJZ7cbhJW`8YhU]`g

7cbj Ybcfg

B Ua Y	9a U]`	5j U]`UV]`]m	@cW]hcb	D\cbY
K U\ ; i Ub`@a	k [`]a 4 i bgk "YXi "Ui	D`YUgY `W`b hJW`j]U Ya U]`	A cfj Yb`6fck b &()	- ' ,) `% *%

GW`cc``7cbhJW`h`bZcfa Uh]cb

GW`cc``cZ<i a Ub]h]Yg`UbX`@Jb[i U[Yg

@cW]hcb. `GW`cc``C Z]W`Z`A cfj Yb`6fck b`6i]X]b[ž`@Yj Y``&ž&),

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

D\cbY. `ž`*%&`- ' ,) `%*, %

: U! . `ž`*%&`- ' ,) ; , +\$)

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

7 ci fgY'8YHJ`g

7 fYX]hDc]bqg`*`

Gi a a UfmicZħY'7 ci fgY

H\]g`Wđi fgY`Yb[U[Yg`k]ħ`_Ym]XYUg`UbX`]ggi Yg`]b`7`\\]bYgY`Gh`X]Yg`" ģiU`gc`fY!j]g]cbg`UFYUg`ħ.Uh`\\Uj`Y`
VYYb`Wđj`YfYX`]b`cħ.Yf`Wđi fgYg`]b`ħ.Y`A`U`c`f`"H`\\YgY`]bW`i`XY`7`\\]bYgY`"Ub[i U[Y`gh`X]Ygž`"]h`fUhi`fYž`Z`a`ž`
a`YX]Už`h`Ubg`U]h`cbž`Ubħ.fcd`c`[miUbX`[YbXYf`gh`X]Yg`"Mci`"UfY`YbWđi`fU[YX`ħc`fYZYWđi`dcbž`fYj`]Yk`"UbX`
i`gY`ħ.Y`_bck`YX[Y`"UbX`"Ub[i U[Y`Wđa`dYħ`bW`"UWđi`]fYX`Z`ca`"ħ.YgY`"UfYUg`cZgh`XmiUbX`Wđbg]XYf`"ck`"mci`
W]b`i`h`]gY`ħ.Ya`"Z`f`mci`f`UWUXYa`]Wcf`WfYfYf`Z`h`fYg`"Mci`"k`]"`[U]b`"U`a`cFY`ħ.Yc`fYh]WU`"UbX`"\\]għc`f]WU`
dYfgdYW]j`Y`"cb`7`\\]bU`"UbX`7`\\]bYgY`"Gh`X]Yg`"H`\\Y`"YUfb]b[`k`]"`VY`Z`UW]h]UħYX`VmU`fUbb[Y`cZ`UW]j`]h]Yg`
]bW`i`X]b[`]bXYdYbXYbh`fYgYUfW`"dfc`Y`W]gž`c`fU`"dfYgYb`h]h]cbg`"UbX`YggUmik`f]h]b[""H`\\fci`[`\\`ħ.Y`Wđi`fgYž`mci`
UfY`ħc`"YUfb`"UbX`fYZYWđi`cb`ħ.Y`Wđb`h]l`h]ž`a`Yħc`Xg`"UbX`"\\]għc`f]Yg`]b`k`"\\W`7`\\]bYgY`"Gh`X]Yg`"Ug`VYYb`
Uddfc`UW`YX`/ħc`[U]b`"Ub`]bZ`fa`YX`i`bXYfgh]UbX]b[`cZ`ħ.Y`_Ym]ggi Yg`UbX`XYVUħY`g`Uvci`h`Wđb`h]a`d`cfUfm]UbX`
"\\]għc`f]WU`"7`\\]bU`/ħc`"fYj`]Yk`"UbX`i`dXUħ`"gW`k`"Ufg`\\d`"cb`7`\\]bYgY`"Gh`X]Yg`Z`ca`"Ub`]bZ`fa`YXž`W]h]WU`"UbX`
]bħY`fX]gW]d`]bUfmidYfgdYW]j`Y`"

7 ci fgY`@YUfb]b[`Ci`hWđa`Yg

%`5`Wđi`]fY`_bck`YX[Y`]bXYdYbXYbh`mž`i`h`]g]b[`Vch`"df]a`Ufm]UbX`"gYWđbXUfma`UħY`f]U`g`
&`8`Ya`cbgh`fUħ`WđbW`dh`U`"UbX`dfUW]WU`"g`_]g`Z`f`W]h]WU`"Ybei`]fm]UbX`dfcV`Ya`"gc`j`]b[`cb`]ggi`Yg`cZ`
XYVUħYg`
'`" `D`"Ub`"UbX`Wđa`d`Yħ`"U`fYgYUfW`"dfc`Y`W`h`
(`" `5`f]h]W`"Uħ`"gdYW]U`]gYX`_bck`YX[Y`cZ`7`\\]bU`"UbX`UgdYW]g`cZ`7`\\]bYgY`"Gh`X]Yg`
)`" `9`b[U[Y`]b`"fYUgcbYX`"UbX`cdYb!`a`]bXYX`X]gW`gg]cb`"UbX`XYVUħY`"

HYUW`X]b[`GħfUħY`[]Yg`

H\]g`W]d`għc`bY`Wđi fgY`]g`ħ.Y`"Ugh`Wđi fgY`Z`f`gh`XYbh]g`]b`ħ.Y`7`\\]bYgY`"Gh`X]Yg`"UbX`5Xj`UbW`X`7`\\]bYgY`
Gh`X]Yg`a`U`c`fg`" ģi]g`XYg[]bYX`ħc`dfc`j`XY`"Ub`cddc`f]i`b]m]Z`f`gh`XYbh]g`ħc`fYZYWđi`cb`ħ.Y`]f`Yi`dYf]YbW]g`"UbX`
_bck`YX[Y`]b`7`\\]bYgY`"Gh`X]Ygž`ħc`Wđbgc`"XUħY`k`"\\Uħ`h`Ym`\\Uj`Y`"YUfb`hd`fYj`]ci`g`mž`"UbX`ħc`dYf`d`UfY`ħ.Y`]f`
fUbg]h]cb`"b]h`c`ħ.Y`k`c`f`_Z`c`f`W`"c`f`dc`gh[fUXi`UħY`"gh`Xm`" ģi]b]h]Y`[fUħY`g`_bck`YX[Y`[U]bYX`ħ.fci`[`\\`d`fYj`]ci`g`
Wđi fgYk`c`f`_UbX`c`j`YfgYUg`Yi`dYf]YbW`"UbX`Vi`]Xg`c`b`ħ.Uh`WđbW`dh`U`Z`ci`bXU]h]cb`ħ.fci`[`\\`U`a`cFY`
ħ.Yc`fYh]WU`"UbX`"\\]għc`f]WU`"dYfgdYW]j`Yž`]b]h]Y`[fU]h] Y`"UbU`mg]gž`dfUW]WU`"Udd`]W]h]cb`"UbX`W]h]WU`"ħ.]b`_]b[""H`\\Y`
Wđi fgY`]g`Wđa`d`cgYX`cZU`gYf]Yg`cZ`ħ.Ya`YX`"Y`W`i`fYgž`]b!`WUgg`X]gW`gg]cbgž`k`c`f`_g`c`dg`"UbX`dYfYgYb`h]h]cbg`" ģi`
]g`VUgYX`c`b`ħ.Y`d`f]bW]d`Y`cZ`gh`XYbh]g`fYg`Z`[i]YX`"YUfb]b[""H`\\Y`fci`Y`cZ`ħ.Y`Wđi fgY`Wđc`fX]bUħc`f`UbX`"Y`W`i`fYf`
]g`ħc`W`YUħY`"Ub`]b]h]Y`"W`i`U`"migh]a`i`"U]h]b[`]UbX`Wđc`dYfU]h] Y`"YUfb]b[`Ybj`]f`c`ba`Ybh`Z`f`gh`XYbh]g`ħc`Yb[U[Y`]b`
X]U`c[i Yg`k`]ħ`YUW`X`cħ.Yf`]b`UbX`ci`ħcZ`WUgg`f`c`ca`ž`VYg]XYg`dfc`j`X]b[`]Ub`]b]h]Y`"W`i`"\\]għc`f]WU`"dYfgdYW]j`Y`
UbX`gdYW]U`]nYX`X]gW]d`]bUfmiZ`Ua`Yk`c`f`_"`Gh`XYbh]g`UfY`YbWđi`fU[YX`ħc`fYUX`Yi`dUbg] Y`m]UbX`Z`c`ghY`f`U`
dfc`Xi`W]j`Y`fY`U]h]cbg`\\d`k`]ħ`ħ.Y`V`f`c`UXY`f`UWUXYa`]W`Wđa`a`i`b]m`"@Y`W`i`fYg`"UbX`h`ħc`f]U`g`U]a`"ħc`V`fU]b]għc`fa`
UbX`[]j`Y`gh`XYbh]g`cddc`f]i`b]h]Yg`ħc`f`Wđi`i`bXYfgh]UbX`"UbX`UWđi`]fY`"U`gdYW]U`]gh`_bck`YX[Y`cZ`7`\\]bUž`7`\\]bYgY`
W`"h`fYž`\\]għc`fmi]UbX`"Ub[i U[Y`/f&`Ē`fYj`]g]h]YUf]Yf`"YUfb]b[`Yi`dYf]YbW`gž`"UbX`]XYbh]h]m]X]ZY`fYb`h]g`fYUa`g`cZ`
ħci`[`\\]h]g`XYj`Y`cdYX`]b`dUf]h]W`"Uf`UfYUg`]b`fYW`bh]m]YUfg`/f`Ē`Yi`d`c`fY`X]gW]d`]bUfmi]UbX`]b]h]fX]gW]d`]bUfm`
Uddfc`UW`Yg`"UbX`a`Yħc`Xc`c`[]Yg`]b`fYgYUfW]b[`dUf]h]W`"Uf`ħc`d]W]g`]b`7`\\]bYgY`"Gh`X]Yg`"

5ggYgga Ybh

8YHU]g'cb'5ggYgga YbhF Yei]fYa Ybhg.

Dfc YW8YgW]dh]cb#9ggUmDfcdcgU'.

Mci 'bYXX'hc'gi Va]hU'bYUhmK f]hYb'dfcdcgU'XYgW]V]b['hY'fYgYUfW' dfc YWmci '\Uj Y'bY[ch]UH'X'k]h
mci f'YW'fYf'Z'UbX'\ck 'mci 'd'Ub'hc'i bXYfU_Y]h' #ig\ci 'X']bW' XY'hY'Z'ck]b['UfYUg.

5ggYgga Ybh8YhU]`g

5ggYgga Ybh%`A ccX`Y`Dcghg/`8]gW`gg]cb`@YUXYf

GHUfhXUH. `Bch5dd`]WVY

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

8YhU]`g.

K YY_`mA ccX`Y`Dcghg/`Uh`YUghicbY`k YY_`hc`YUX`X]gW`gg]cb"

⌘!WUgg`ZYXVUW_"

Gi Va]gg]cb`bchYg.Gi Va]hcb`A ccX`Y`VmA`cbXUmbccb`df]cf`hc`h\Y`k YY_`cZX]gW`gg]cb

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

5ggYgga Ybh&.`Dfc`YWh8YgW]dh]cb`#9ggUmDfcdcgU`

GHUfhXUH. `K YY_`"

8YhU]`g.

6]V`]c[fUd\`mfYgYUfW\`/`dfcdcgU`cZ]bU`YggUm`

⌘!WUgg`ZYXVUW_"

Gi Va]gg]cb`bchYg.GcZhWcdmhc`VY`gi Va]hX`Y`YWfcb]W`m

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

5ggYgga Ybh' .`DfYgYbHh]cb

GHUfhXUH. `

8YhU]`g.

%)!a]bi hY`dfYgYbHh]cbž) !a]bi hY`X]gW`gg]cb`YUW"

⌘!WUgg`ZYXVUW_"

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

5ggYgga Ybh(. `F`YgYUfW\`9ggUm

GHUfhXUH. `Bch5dd`]WVY

@Yb[h. ') \$\$'k cfXg

8YhU]`g.

') \$\$!k cfX`YggUm'

: UW!hc!ZJW`a YYh]b[`k]h `]bgrfi Wcf`cb`mi dcb`fYei YghcZgh XYbt'

Hi fb]h]b`gYh]b[. H\]g`Ugg][ba Ybh]g`gi Va]hYX`h`fci [\ `Hi fb]h]b`UbX`gh XYbtg`Xc`bchgYY`Hi fb]h]b`g]a `]Uf]mfYdcfng"

K YY_+. '&* 'C Wtc VYf!' '\$ C Wtc VYf	GYa]bUf	@Ub[i U[Y 'UbX' ÷Yb]m Dfc ^Ww8YgW]dh]cb '#9ggUmDfcdcgU` Ž 6]V`]c[fUd\mXi Y'f] i Ł
K YY_ , . '&Bcj Ya VYf!' '* Bcj Ya VYf	GYa]bUf	7]bYa Uh]WUbX'h\Y'DYfZ:fa]b['5f]g
K YY_ - . - 'Bcj Ya VYf! '% 'Bcj Ya VYf	GYa]bUf	Dfc ^WwdfYgYbH]cbg'UbX'X]gW gg]cb'f] i Ł
K YY_ %\$. '%* 'Bcj Ya VYf! &\$'Bcj Ya VYf	GYa]bUf	K f]h]b['k cf_g\cd

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

F Yei]fYX`UbX`fYWca a YbXYX`fYUX]b[g`cb`A ccX`Y

F YWca a YbXYX`F Ygci fWg

Gi Va]gg]cb 'cZ5ggYgga YbhiHUg_g

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

Ʒmci 'YbWci bHYf'U'dfcV'Ya 'k \Yb'UH'Ya dh]b['hc'gi Va]hmc i f'Ugg][ba YbhiH'fci [\ 'Hi fb]h]bž'd'YUgY
HY'Yd\cbY'9I HYfbU'Gi ddcfhcb'-',) " ' ' %cf'Ya U] 'H'Ya 'cb'YI HYfbU'HY'f'gi 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'm'YUfI" Ʒmci
UfY'i bUV'Y'hc'gi Va]hmc i f'Ugg][ba YbhiXi Y'hc'U'Zi 'hk]H'Hi fb]h]b'mci 'a UmUdd'm'Zc'f'Ub'YI HYbg]cbž'Vi hmc i
a i ghfYHU]b'mci f'h]W_Yhbi a VYf'Z'ca '9I HYfbU'Gi ddcfhfU'cb['k]H'UbmcH'Yf'f'Yj UbhXcW a Yb'g'k'hc
]bWi XY'Ug'Yj]XYbVW'hc'gi ddcfhmc i f'YI HYbg]cb'Udd']W]h]cb" Ʒmci 'Ya U] '9I HYfbU'Gi ddcfhmc i 'k]
Ui 'ca UH]W]m'f'YW]j Y'U'h]W_Yhbi a VYfž'Vi h]Zmci 'HY'Yd\cbY'mci 'k]'b'Y'X'hc'gd'Y'W]W]m'Ug_'Zc'f'cbY"
Hi fb]h]b'U'gc'dfcj]XYg'i dXUH'g'cb'H'Y]f'gm'g'Ya 'g'H'U'h'g'cb'Hk]H'Y'f"

; YbYfU'mž'UggYgga YbhiHUg_g'a i ghVY'gi Va]H'Y'X'Y'Y'W'f'cb]W]m'j]U'Y]H'Y'f'Hi fb]h]b'cf'U'A ccX'Y
Ugg][ba YbH' 'b]bg'U'bVW'g'k \YfY'H'g]g'bc'hd'cgg]V'Yž'hk]'VY'g'H'Y'X'cb'mci f'W'ci fgY'g'A ccX'Y'g]H'k]H
U'HY'fbUH] Y'gi Va]gg]cb'XYHU]g"

: cf]bZ'fa UH]cb'cb'\ck 'hc'gi Va]hUgg][ba Yb'g'cb]bY'j]U'A ccX'Y. \h'hdg.#gh XYb'hi bgk "YXi "Ui #ck!
gi Va]hUgg][ba Yb'ha 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`U`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]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'fg'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](#)

