



ARTS3455

7cbhYa dcfUfm7 \]bYgY '@]HYfUhi fY

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

7 ci fgY`Cj Yfj]Yk

`GHUZZ7cbhUWh8YHJ`g`

`7cbj Ybcfg`

B Ua Y	9a U`	5j U]UV]`]m	@cWjhcb	

7 ci fgY'8YHJ]`g

7 fYX]h'Dc]bHg '*`

Gi a a UfmcZh\Y'7 ci fgY

Gi VYWh5fYU.`

5ggYgga Ybh

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y'8UH	Gh XYbh@YUfb]b[Ci hWta Yg'5ggYggYX
A U'cf'9ggUmi) \$i	&(#\$(#&\$%- '%%\$\$'DA	%ž&ž ž(
ᄁX]j]Xi U`dfYgYbHU]cb`]b h\Ya YX[fci d'gYH]b[`	' \$i	: fca `k YY_` `hc`k YY_;	%ž&ž ž(
ᄁ!WUgg`hYgh	&\$i	&(#\$(#&\$%- '%&.&\$'DA	%ž&ž

5ggYgga Ybh8YHU]`g

5ggYgga Ybh%`A U'cf'9ggUm

GhUfhXUH. `Bch5dd`]WV`Y

8YHU]`g. `Gh XYb]k f]h`Ub`YggUmifWU"" ž) \$\$!(\$\$\$ k cfXgŁVUgYX`cb`]bXYdYbXYbhfYgYUfW": YYXVUW_]]U
]bX]j]Xi U`Wta a Yb]g`UbX`fi Vf]W`H\]g`]g`h\Y`Z]bU`UggYgga YbhZcf`UH]bXUbVW`di fdcgYg"

Hi fb]h]b`gYH]b[. `H\]g`Ugg][ba Ybh]g`gi Va]hYX`h`fci [\ `Hi fb]h]b`UbX`gh XYb]g`WUb`gYY`Hi fb]h]b`ga]Uf]m
fYdcfg"

5ggYgga Ybh&`ᄁX]j]Xi U`dfYgYbHU]cb`]b`h\Ya YX[fci d'gYH]b[

GhUfhXUH. `Bch5dd`]WV`Y

8YHU]`g. `Gh XYb]g`dfYgYb]fUbX`UFY`a Uf_YXŁ]bX]j]Xi U`mf%\$`a]bi hYg`YUWŁŁcb`U`WŁcgYb`hcd]Wk]h]b`h\Y
Z]Ua Yk cf_`cZU`h\Ya YX[fci d`"H\Y`hcd]Wg`UFY`VUgYX`cb`Ugg][bYX`fYUX]b[g"Gh XYb]g`UFY`cf[Ub]nYX`]b]c
[fci dg`k]h`U`g\UFYX`h\Ya Yž`h\Y]f`]bX]j]Xi U`dfYgYbHU]cbg`XYU`k]h`U`X]ZYfYbhUgdYWŁcZ`h\Y`h\Ya Y"
: YYXVUW_]]U]bX]j]Xi U`Wta a Yb]g"

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

5ggYgga Ybh' . ᄁ!WUgg`hYgh

GhUfhXUH. `Bch5dd`]WV`Y

@Yb[h. `&`ci fg

8YHU]`g. `Gh XYb]g`Wta d`YH`U`hYghfWU""&`ci fgŁ]bWi X]b[`a i`h]d`Y!WŁc]WŁž`h\Yb`g`c]f]`UbX`cb[Yf]Ub]gk Yf
ei Yg]h]cbg"Gh XYb]g`fYW]j Y`U`a Uf_`UbX`WUb`Wcbgi`h\Y`YWŁi`fYf`Zcf`Z`f`h\Yf`ZYXVUW_

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

5 HbXUbW F Yei]fYa Ybhg

5 HbXUbW cZ@YWi fYg#Hi hcf]U'g]g'a UbXUhcfm]b'h]g'Wci fgy"i bYI W gYX'UVgYbW'Zfca 'a cFY'h.Ub'&\$i cZ@YWi fYg#Hi hcf]U'g k]'fYgi 'h]b'hY'Uk UfX'U'ZU]'[fUXY"

h'YWi fY'UbX'h hcf]U'g'mci 'k]'UW]j Y'mYb[U[Y'k]h' WcfY'Wci fgy'Wcbh'bh'YbUV']b['mci 'hc'UhtU]b'7 @C '% UbX'7 @C '&"

7 ci fgY'GVX YXi `Y

[J \]yk WUgg'ha YhUVY](#)

H]a YhUV`Y`

8 UHr	HmdY	7 cbhYbh
K YY_% '% : YVfi Ufm! '&(: YVfi Ufm	@YWi fY	hfcXi W]cb'!!'FZW5a` UWbfS` V : [efack aX? aVWd 5Z[Ww>[fWdSfgdW
K YY_&.&) : YVfi Ufm!' A UfW	@YWi fY	=Wk 8[YgdW S` V ;eegW aXS 5Z[Ww>[fWdSck ? aVWd [fk, >g J'g` -DWSV[Ye, /: S` Vagfefz
	Hi hcf]U'	GYa]bUf.'@ 'L i b'UbX'a cXYfb'7\]bYgY'ZW]cb
K YY_.'.('A UfW '! '%\$ A UfW	@YWi fY	=Wk 8[YgdW S` V ;eegW aXS 5Z[Ww>[fWdSck ? aVWd [fk, @W BaWfckz DWSV[Ye, 'fk UbXci hgk'
	Hi hcf]U'	E W_ [Sd ` W baWfck S` V _ aVWd 5Z[S-efgVW f bdWw fSf[a` e
K YY_(. '%A UfW '! '%+ A UfW	@YWi fY	=Wk 8[YgdW S` V ;eegW. LZS` Y 3[↑ YzF YUX]b[g. 'fk UbXci hgk'
	Hi hcf]U'	E W_ [Sda` LZS` Y 3[↑ Y S` V _ aVWd 5Z[Ww X]Uf[a` -efgVW f bdWw fSf[a` e
K YY_) . '% 'A UfW '! '&(A UfW	@YWi fY	=Wk 8[YgdW S` V ;eegW, G\Yb'7 cb[k Yb" F YUX]b[g. 'fk UbXci hgk'
	Hi hcf]U'	GYa]bUf'cb'G\Yb'7 cb[k Yb/ghi XYbhdfYgYbH]cbg
K YY_*.&) 'A UfW '! " % A UfW	@YWi fY	7Sd'k S` V >SfWE aU[S]ef >[fWdSfgdW K Ub['M Ub'U]b/ K Ub['A Yb["'F YUX]b[g. 'E fgVk = [f, ' "
	Hi hcf]U'	gYa]bUf'cb'9Uf'mUbX'@U]Y'GcW]U']gh]hYfU] fY/ ghi XYbhdfYgYbH]cbg
K YY_+. '%5df]'!' + '5df]'	@YWi fY	A fZWdi Ske aXi df] Y 5Z[Ww_ aVWd [fk S` V Z[efack, 6U]L]Ubrcb[/7\Yb'M]bn\Yb" F YUX]b[g. 'E fgVk = [f, ' "
	Hi hcf]U'	GYa]bUf'cb'6U]UbX'7\Yb/a cXYfb'7\]bYgY'\]g'hc'fm'efgVW f bdWw fSf[a` e
K YY_.,. ; '5df]'!' %('5df]'	@YWi fY	BaefZeaU[S]ef [fWdSfgdW 4S[6Sa W' S^Z BaWfckz DWSV[Ye, E fgVk = [f, ' "
	Hi hcf]U'	GYa]bUf'cb'dcgh]gcW]U']gh'7\]bYgY'']hYfU] fYzdcYf'm'ghi XYbhdfYgYbH]cbg

K YY_-.% '5df]'!'&% 5df]	@YWi fY	BaefZeaU[S1ef {fWdSfgdW A c'MUb!!':]W]cb" F YUX]b[g.' 'fk UbXci hgL"
	Hi hcf]U'	GYa]bUf'cb'dcghgcW]U']gh7 \]bYgY'']hYfUhi fyž Z]W]cb/ ghi XYbhidfYgYb]h]cbg"
K YY_%.&&'5df]'!'&, 5df]	@YWi fY	b WUgg'hYgh

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

HYI HVcc_`8YHU]`g
5F HG' () `5a` fW_ badSck 5Z[`W6W>[fW6SfgdWE fgVk = [ff`Uj U]UV`Y`Zca `i BGK `6cc_`GhcFY/ \UbXci hg`UbX`A ccX`Y`i d`cUXg

F YWca a YbXYX`F Ygci fWg

K YVg]hYg
: cf`hY`"]VfUfm` \hfd.#k k k"]VfUfm`i bgk "YXi "Ui #
: cf`hY`i BGK `@YUfb]b[`UbX`HYUW\]b[`i b]h` \hfd.#k k k`"h "i bgk "YXi "Ui
<Ufj UfX`F YZYfybW]b[`GmgHYa .` \hfdg.#gh XYbh`i bgk "YXi "Ui #AUfj UfX!fYZfybW]b[

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

Gh XYbhZYXVUW_g`Ufy`hU`_Yb`]bhc`W6bg]XYfUh]cb`]b`W6i`fgYz`UggYgga`Ybhg`UbX`XY`]Yf]b[`a`Yh`cXg`fYj`]g]cbg"

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`h`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`fI`*)`XUmg`U`m`Y`UfL`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`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`Wi`XY`Ug`Y`j`X`Y`b`W`hc`gi`ddcfh`mci`f`YI`H`f`bg]cb`Udd`]W`h]cb"Ʒmci`Ya`U]`9I`H`f`b`U`Gi`ddcfh`mci`k`]`
Ui`h`ca`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`Ug`_`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`Ug`_`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`i`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 bYghmiUbX`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.

7cdm]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[YgžUfhUbX`XYg][b`dfc`YWgžUg`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 cghmiFYhU]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 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["

7c`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_]7c`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'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'c.#\]i V'Y'W'i \]X'Yg"\]VfUfm'i bgk "YXi "Ui #' \]gY#\]Vci h' \]gY](#)

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/

