



ARTS3243

F Ya U_]b['BUh fY. 'H\Y 'Dc`]h]Wg`cZ6]chYWXbc`c[m

HYfa `Cby`#`&\$%

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

7ci fgY`Cj Yfj]Yk

`GHJZ`7cbhJW`i8YHJ`g`

`7cbj Ybcfg`

B Ua Y	9a Uj`	5j Uj`UVj]m	@cWjhcb	D\cbY
B]W`Ug`F Uga i ggYb	B "F Uga i ggYb4 i bgk "YXi "Ui	dcg`YX`cb`A ccX`Y	A cfj Yb`6fck b` ' %`	- ' ,) `&' *% Ya Uj`]Zbc Ubgk Yf

GVXcc``7cbhJW`i`bZcfa Uhjcb

GVXcc``cZ<i a Ub]hYg`UbX`@Ub[i U[Yg

@cWjhcb. `GVXcc``C ZZ Ub]h

7 ci fgY'8YHJ`g

7 fYX]hDc]bhr '*`

Gi a a UfmicZhY'7 ci fgY

Gi VYWh5fYU.'7` h[da` _ W fS^: g_ S` [f]W

H\]g`Wci fgY`YI Ua]bYg`k \Uha Ubm\Uj Y`WU`YX`hY`"Wbhi fmicZhY` [YbY`"UbX`]hg`dcfYb]U`Zcf`fYg\Ud]b[`hY`
Ybj]fcba YbhiUbX`\i a Ub]m'6]chYWXbc`c[mUWb`VY`i bXYfgtcX`Ug`U`gcW]U`z`dc`]h]WU`UbX`W`hi fU`dfc`YWhUg`
a i WX`Ug`U`hYWXb]WU`cbY" `b`h]g`Wci fgY`k Y`Wcbg]XYf`hYgY`]ggi Yg`h`fci [\`hY`df]ga`cZ`WcbhYa`dcfUfm`
Ybj]fcba YbhiU`h]b_]b[`zXfUk]b[`cb`U`a`i`h]X]gW]d`]bUfmitc``_]hZca`gW]YbW`gh`X]Yg`fGHGtZ`W`hi fU`UbX`
dc`]h]WU`hYcfmz`UbX`gcW]c`c[m`K`Y`fYfUW`hY`Ya`Yf[YbW`cZV]chYWXbc`c[mZca`]hg`YUfm]a`U[]b]b[g`
h`fci [\`]hg`Ya`Yf[YbW`Ug`U`fYU`dfc`YWh]b`hY`h`Yb]Yh`Wbhi`fmz`UbX`YI`d`cfY`U`fU]b[Y`cZ`WcbhYa`dcfUfm`
WUgY!gh`X]Yg`gi`WX`Ug`; A`ZcXz`[YbY`hYfUdmzV]c!dfc]gdYW]b[`z`bUbcfYWXbc`c[mUbX`gmbhYh]W]c`c[m`
Mc`i`k`]`Uj`Y`hY`cddcfh`b]mhc`gY`YWh]ggi`Yg`gi`WX`Ug`hYgY`Zcf`XYdYfYI`d`cfU]h]cb`]b[fci`d`dfc`YWg`
]bj`c`j`]b[`]bXYdYbXYbhfygYUfW`UbX`UbU`mg]"

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

- %`9I`d`U]b`hY`\]g]cf]WU`z`dc`]h]WU`UbX`W`hi fU`WcbhYI`hg`h`Uh\Uj`Y`g\UdYX`hY`Ya`Yf[YbW`cZ`
V]chYWXbc`c[mUbX`hY`V]cgW]YbW]g`
- &`5bU`mgY`hY`]bhfygYW]cbg`VYh`YYb`[YbYh]W]fYgYUfW`UbX`g\]Zg`]b`WcbhYa`dcfUfm]dc`]h]WU`
cf[Ub]gU]cb`UbX`Ybj]fcba YbhiU`dfUW]W`
- '`5dd`mgY`YW]X`X]gW]d`]bUfmiUddfcUW]Yg`UbX`WcbW]dh`U`hc`g`hc`i`bXYfg]UbX]b[`hY`gcW]U`UbX`
Ybj]fcba YbhiU`UgdYW]cZV]chYWXbc`c[mUbX`hY`V]cgW]YbW]g`
- ("`5dd`mg_]`g`cZW]h]WU`UbU`mg]gZ`dfcV`Ya`g`c`]b[`UbX`]bhYdfYU]h]cb`]b`Vch`k`f]h]b`k`cf`_`UbX`]b!`
WUgg`X]gW`gg]cbg`
-)`7cbXi`Wh]bXYdYbXYbhfygYUfW`UbX`XYa`cbghfU]h`U`W]dUV`]mhc`UggYa`V`Y`z`gmbhYg]gY`UbX`
Wca`a`i`b]W]h`fYgYUfW`z]bX]b[g`UbX`UbU`nt]WU`]bhYdfYU]h]cbg`

HYUWX]b[`GhfU]h[]Yg`

H\]g`Wci fgY`fYei]fYg`gh`XYbh]h`Yb[U[Y`k`]h`\][\!`Yj`Y`UbU`nt]WU`gW]c`Ufg\]d`]b`YI`d`cf]b[`UbX`UbU`mg]b[
hY`WcbhYa`dcfUfmV]cgW]YbW]g" `h`k`]`fYei]fY`fYZYW]j`Y`UbX`gY`Z`W]h]WU`YUfb]b[`hc`[YhYf`k`]h`U`W]dUW]m`
h`UggYa`V`Y`UbX`gmbhYg]gY`]bZ`fa`U]h]cb`Z`ca`U`fU]b[Y`cZ`gci`fW]g`UbX`X]gW]d`]bUfmiVUW_]`fci`bXg`"hY`
Wci fgY`U`gc`k`]`fYei]fY`gh`XYbh]h`Udd`mi`hYgY`]bg][\hg`]b`U`fYU`!k`cfX`YI`Ua`d`Y`UbX`h`Wca`d`Yh`U`a`U`cf`
d]YW`cZ`UggYgga`Ybhi`h`UhYI`Ua`]bYg`hY]f`W]dUV`]h]Yg`h`Xc`h]g`"hY`gY`cV`YW]j`Yg`k`]`VY`UW]j`Y`X`
h`fci [\`YWh`fYgZ`]b!XYd`h`h`h`f]U`X]gW`gg]cbgZ`]bXYdYbXYbhfygYUfW`UbX`hY`dfYdUfU]h]cb`cZ`UggYgga`Ybh`
h]g`g" `b`cfXYf`Zcf`gh`XYbh]h`X`Yj`Y`cd`hY`Z`ca`g`cZW]h]WU`fYZYW]cb`bYW]ggUfm]Zcf`h]g`Wci fgYz`
dUf]h]W]dU]h]cb`]b`h`h`f]U`X]gW`gg]cb`k`]`VY`Ya`d`U]g]YX`UbX`]g`fYZYW]h]X`]b`hY`UggYgga`Ybh]gW]YXi`Y"

5ggYgga Ybh

H\Y`]ghcZWci fgY`fYUX]b[g`UbX`h\Y`gWXYXi`Y`cZk`Uhmci`k`j`VY`YI`dYWYX`hc`fYUX`Zc`fYUWX`k`YY`fj`Vi`nn`
 [fci`d`X]gW`gg]cbz`]g`dchgYX`cb`h\Y`Wci`fgY`A`ccX`Y`g]fY`fYUX]b[g`j`jU`@Y[`Ubhc`dcfU`E"

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K`Y][`h	8i`Y`8UH`	Gh`XYbh`@YUfb]b[` Ci`hWca`Yg`5ggYggYX`
6i`nn`[`fci`d`fci`]nfi`	%\$i`	K`YY`_`m]b`Hi`hc`f]U`	%z&z(`
F`YgYUfW`Dfc`YW`/`9ggUm`)`\$i`	`A`Um`&`\$`%`/`(`.``\$`\$`DA`	%z&z`z(`z`)
7`cbW]gY`YggUm`g`	(`\$i`	k`YY`_`n`z`Uh(`da`+`X`Um`g`U`Z`Y`f` h\Y`X`UH`k`Y`b`hc`d]Wk`Ug` c`Z`Y`f`Y`X`	%z&z`

5ggYgga Ybh8YH]`g`

5ggYgga Ybh%`6i`nn`[`fci`d`fci`]nfi`

GhUfhXUH`.Bch5dd`]WVY`

8YH]`g`.Gh`XYbh]fidUfh]WdU]cb`]b`h`hc`f]U`X]gW`gg]cbg`k`j`VY`UggYggYX`h`fci`[`\`ci`h`h\Y`Wci`fgY`cb`U`
 DUgg#`U]`VUg]g`UW`W`fX]b[`hc`k`Y`h`Y`f`h\Y]f`X]gW`gg]cb`[`fci`d`]bh`Y`][`YbhmiUXXfYggYX`U`g`Y`hei`Y`gh]cb`Zc`f`
 X]gW`gg]cbz`UbX`h\Y`]bX]j`]Xi`U`gh`XYbhk`Ug`c`VgY`f]Y`X`hc`UW`h]Y`mdUfh]WdU]h`"9UWX`k`YY`fj`h`hc`f]U`
 X]gW`gg]cb`ei`Y`gh]cbg`d`fY`dU`fY`gh`XYbh]g`hc`k`f]h`i`d`h\Y`cd]cbU`k`YY`_`m`Y`ggUm]hc`d]W`fVY`ck`E`":`YYXVUW`_`Vm`
 dfca`dh]bX]j`]Xi`U`Ya`U]`]b`h\Y`Y]YbhU`gh`XYbhX]X`bchDUgg]b`U`k`YY`_`"

Gi`Va`]gg]cb`bch]g.bc`k`f]h]b`gi`Va`]gg]cb`]g`]bj`c`]YX`

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

5ggYgga Ybh&.`F`YgYUfW`Dfc`YW`/`9ggUm`

GhUfhXUH`.Bch5dd`]WVY`

@Yb[`h`.&*\$`\$\$`a`]bz`&\$\$`a`U`

8YH]`g`.F`YgYUfW`d`fc`YW`z`k`\]W`a`Um`VY`W`cbXi`W`Y`X`Vm[`fci`dg`c`Zi`d`hc`h`f`Y`Y`gh`XYbh]z`k`]h`U`"\$\$\$`k`c`f`X`
 YggUm]Ug`h\Y`UggYggYX`ci`hWca`Y`"5`gh`XYbh]b]U`[`fci`d`]gi`Va`]hgUa`Y`YggUm]UbX`fYW`j`Y`g`Ua`Y`a`Uf`_`
 Gh`XYbh]k`]U`j`Y`U`W`c]W`c`Z`hc`d]W`g`z`k`\]W`k`]W`U`Y`b[`Y`h`Ya`hc`W`cbg]XY`f`W`b`fU`Wci`fgY`h`Ya`Y`g`
 Gh`XYbh]k`]VY`YI`dYWYX`hc`a`U`Y`i`g`Y`c`Z`Wci`fgY`fYUX]b[g`UbX`W`cbXi`W]bX`Y`d`Y`b`X`Y`bh`f`Y`g`Y`U`f`W`
 K`f]h]b`Z`Y`X`V`U`W`_`H\]g`]g`h\Y`Z]bU`UggYgga`YbhZc`f`U`h]b`X`U`b`W`di`f`dc`g`Y`g`"

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

Gh`XYbh]k`]VY`Yb`Wci`fU[`YX`hc`d`f`c`d`c`g`Y`h\Y]f`ck`b`hc`d]W`g`Vm`k`YY`_)`"5`gh`Ub`X`U`f`X`hc`d]W`k`]U`gc`VY`]ggi`YX`
 Vm`k`YY`_)`z`k`\]W`a`i`gh`VY`X`cb`Y`Vm`Ub`m`c`b`Y`k`\`cg`Y`d`f`c`d`c`g`Y`X`f`Y`g`Y`U`f`W`d`fc`Y`W`hc`d]W]g`b`ch`U`d`d`f`c`j`YX`"5`
 YggUm]g`Wci`Ui`V`X`cb`Y`k`Y`bg`Y`W`cb`g`Y`Y`Y`b`X`VY`gc`VY`Y`ck`b`

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

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

Ẓmci `YbWci bhYf`U`dfcV`Ya `k \Yb`U`H`Ya dh]b[`hc`gi Va]hmc i f`Ugg][ba YbhHfci [\`Hi fb]h]bžd`YUgY
H`Yd\cbY`9I H`fbU`Gi ddcfhcb`-` ,) `` `` ` %cf`Ya U]`H`Ya `cb`YI H`fbU`H`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`m`YUfL` Ẓmci
UfY`i bUV`Y`hc`gi Va]hmc i f`Ugg][ba YbhXi Y`hc`U`ZU`i`hik]H`Hi fb]h]b`mci `a UmiUdd`miZc`f`Ub`YI H`bg]cbžVi hmc i
a i ghfYH]b`mci f`h]W`Yhbi a VYf`Zca `9I H`fbU`Gi ddcfhfU`cb[`k]H`Ubmch`Yf`fY`Yj UbhXcW a YbHgk`hc
]bWi XY`Ug`Yj]XYbW`hc`gi ddcfhmci f`YI H`bg]cb`Udd`]W]h]cb" Ẓmci `Ya U]`9I H`fbU`Gi ddcfhmci `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.

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 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["

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 cghcZ'mci f'gh X]Yg'Uhl BGK ""

[\h'hd.##gi V'Y'W'f'i \]X'Y'g""\]VfUfm'i b'gk "Y'X'i "U'i #' \]g'Y'#\]V'ci h' \]g'Y](#)

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/

