



ARTS3450

5Xj UbWX'7 \]bYgY'5

HYfa `Cby`#`&\$%-

7ci fgY`Cj Yfj]Yk

`GHUZZ7cbhUW`i8YHUJ`g`

`7cbj Ybcfg`

B Ua Y	9a U]`	5j U]UV]`]m	@WU]hcb	D\cbY
DfcZ8f`>cb`j cb ?ck U`]g`	^_ck U`]g4 i bgk "YXi "Ui	: f]XUm) da `!`*da	A cfj Yb`6fck b &' -	- ' ,) `%\$&\$

`@YW`i fYfg`

B Ua Y	9a U]`	5j U]UV]`]m	@WU]hcb	D\cbY
<i Ub[\i Ub[`7\Yb	\i Ub[\i Ub["WXYb4 i bgk "YXi "U i			

`Hi hcfg`

B Ua Y	9a U]`	5j U]UV]`]m	@WU]hcb	D\cbY
8f`M]b[`]Gi b	m]b[`]gi b4 i bgk "YXi "Ui			

GWXcc``7cbhUW`i`bZcfa Uh]cb

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

@WU]hcb. GWXcc``C Z]WZ`A cfj Yb`6fck b`6i]X]b[ž`@Yj Y``&ž&),

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

D\cbY. `ž`*%&`- ' ,) `%* , %

: U! . `ž`*%&`- ' ,) `; , +\$)

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

5ggYgga Ybh

5ggYgga YbhHUg_g`

5ggYgga YbhHUg_	K Y][\h	8i Y`8UHŸ	Gh XYbh@YUfb]b[Ci hWta Yg`5ggYggYX
HYgh%	&\$i	K YY_) `hi hcf]U`f&#\$' #&\$%- cf`&#\$' #&\$%- ƒ"	%ž&ž ž(
; fci d`F YgYUfW`Dfc`YWŸg`	(\$i	HfUbg`Uh]cb`]g`Xi Y`]b`k YY_`& f\$` #` #` #&\$%- ƒžk YY_`(fŸ+`#` #` #&\$%- ƒžk YY_`* fŸ %`#` #` #&\$%- ƒžUbX`k YY_`; fŸ(#`(#&\$%- ƒ/; fci d` DfYgYbhUh]cb`]g`Xi Y`]b`k YY_` , `fŸ%`#`(#&\$%- `cf` %&#`(#&\$%- ƒžk YY_`- fŸ%` #`(#&\$%- ƒ`cf`k YY_`%\$ f&*`#`(#&\$%- ƒ/F YgYUfW` DUdYf`]g`Xi Y`cbY`k YY_`UžYf` mci f`[fci d`dfYgYbhUh]cb`"	%ž&ž ž)
7i `hi fU`7ca dcbYbh	&\$i	E i]n`cbY`]b`YWh`fY`k YY_`) f&#`#` #` #&\$%- ƒ/E i]n`&`]b` `YWh`fY`k YY_`%% fŸ \$`#`(#&\$%- ƒ"	(
HYgh&`	&\$i	K YY_`%%Hi hcf]U`g` fŸ \$`#`(#&\$%- `cf`\$`#`#` #&\$%- ƒ"	%ž&ž ž(

5ggYgga Ybh8YHJ]`g`

5ggYgga Ybh%`HYgh%

GHUfhXUHŸ. `Bch5dd`]WUV`Y`

8YHJ]`g. `7ca dfY`Ybg] Y`hŸghcZ`hY`ž]fghZ`k`W`UdhŸfg`fŸ%) ``ci fgƒ": YYXVUW`_j]U`]bX]]Xi U`Wta a Ybhž
fi Vf]WžUbX`]b!WUgg`X]gW`gg]cb`"

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

5ggYgga Ybh&` ; fci d`F YgYUfW`Dfc`YWŸg`

GHUfhXUHŸ. `Bch5dd`]WUV`Y`

8YHJ]`g. `Gh XYbhŸ`Wta d`YH`rk`c`[fci d`dfc`YWŸg. `%ƒHfUbg`Uh]cb`fŸ\$! ƒžUbX`&ƒF YgYUfW``cb`hY]f`WcgYb`
hcd]Wžk`\\W`]W`XYg`U`fYgYUfW`dUdYf`gi Va]hY`X`cb!]`bY`fŸ) ı ƒžUg`k`Y`Ug`U`[fci d`dfYgYbhUh]cb`fŸ) ı ƒ`
H`Y`WUgg`dfYgYbhUh]cb`fŸ`a`]bi`hŸg`dYf`dYfg`cbƒ]g`UggYggYX`cb`]bX]]Xi U`VUg]gžk`\\Y`hY`fYgYUfW`dUdYf`
fŸ) \$!&\$\$\$`W`UfUWŸfgƒ`fYWŸ]j Yg`cbY`a`Uf`_": YYXVUW`_j]U`fi Vf]WUUbX`]b!WUgg`X]gW`gg]cb`"

5ggYgga Ybh' .`7i `hi fU`7ca dcbYbh

GhUfhXUHY. 'Bch5dd`]WUV`Y

8YHU]`g. 'Gh XYbHg`UfY' [] Yb`tk c`]b!WUgg`ei]nnYg`fi \$`a]bi h`g`YUWX`E": YYXVUW_] j]U`fi Vf]WUbX`]b!WUgg X]gW`gg]cb"

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

5ggYgga Ybh(. `HYgh&

GhUfhXUHY. 'Bch5dd`]WUV`Y

8YHU]`g. `7 ca dfY\Ybg]j Y`h`gh`f%) ` \ci fgE`cZ`h`Y`UghZ`k`W`UdH`fg`g]bW`HYgh%"`Gh XYbHg`fYW`]j Y`U`a Uf_ UbX`WUb`W`bgi`h`h`Y`h`UWX]b [`gHUZZ`Z`f`Z`f`h`Y`f`ZYXVUW_`H\]g`]g`h`Y`Z]bU`UggYgga YbhZ`f`U`h`Y`bXUbW` di`fdcgY"

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

--	--	--	--

F Ygci fWg

DfYgW]VYX F Ygci fWg

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`mYUfL` 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 YbHgE`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 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 gZ`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[YgZ`UfhUbX`XYg][b`dfc`YWgZ`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`U`b[]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`Z`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`Yz`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`XUHYz`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'Wcdmf][\hž' BGK 'Gh XYbh7cXY'cZ7cbXi W'Ubx'5Ww'dhUV'Y'I gY'cZ I BGK '⇒H'F Ygci fW'g'Dc`]Wm
- VY'Uk UfY'cZh'Y'ghUbxUfXg'cZVY\Uj]ci f'YI dYW'X'cZYj Yfmcby`]b'h'Y'I BGK 'Wca a i b]m
- `cWJh'gYfj]Wg'UbX'j]bZcfa Uh]cb'UVci hl BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZh'YgY'UfYUg'k]`VY'ZJa]]Uf'hc'mci ž'ch'Yfg'k]`VY'byk " "; U]b]b['U'gc`X'i bXYfghUbx]b['cZU`h'Y fY'UH'X'UgdYW'g'cZ9@G9'k]`Y'd'mci 'a U_Y'h'Y'a cghcZmci f'gh X]Yg'Uhl BGK ""

[\hhd.##ji V'YWf'i \]XYg" \]VfUfm'i bgk "YXi "Ui #' \]gY#JVci h' \]gY](#)

5 WUXYa]WbZcfa Uhcb`

: cfYggYbh]U`ghi XYbh]bZcfa Uhcb`fY`Uh]b[`hc.

- fYei Yghg`ZcfYI hYbg]cb/
- `UhY`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`dfcVWXi fYg/
- gdYW]U`Vc]bg]XYfUh]cb`]b`hY`Yj Ybhcz]`bYgg`cf`a]gUXj Ybh fY/
- ghi XYbhYei]hmUbX`X]gUV`]`hm/
- UbX`chYfYggYbh]U`UWUXYa]W]bZcfa Uh]cbz`gYY

[\hfdg.#k k k "Ufmg"i bkg "YXi "Ui #W ffYbh\]ghi XYbh\]bZcfa Uh\]cb`dfc\]Vc`g!\[i \]XY`\]bYg#](#)

⇒ U[Y`7 fYX]h