



ARTS3055

@hYfUhi fY'UbX'Dck Yf

HYfa 'Hk c''##'&\$&\$



7ci fgY`Cj Yfj]Yk

GHJZZ`7cbHJW`8YHJ]`g

7cbj Ybcfg

B Ua Y	9a Uj`	5j Uj`UVj]m	@cWjhcb	D\cbY
@UYh]U`BUbei YhY	""bUbei YhY4 i bgk "YXi "Ui	6mUddc]bha Ybh	F cVYfh K YVghYf`fcca &%"	- ' ,) `++- &

GWcc``7cbHJW`bZcfa Uhjcb

GWcc``cZhY`5fmg`UbX`A YX]U

F cca `! %&Z`@Yj Y`" žF cVYfhK YVghYf`6i]X]b[`fj %(`

D\cbY. `f\$&L`- ' ,) `(,) *

9a Uj: [gUa 4 i bgk "YXi "Ui](#)

K YVg]hY: [k k k "Ufmg"i bgk "YXi "Ui #gUa](#)

H\Y`GWcc``cZhY`5fmg`UbX`A YX]U`k ci `X`_Y`hc`F YgdYWZ`m5W_bck`YX[Y`hY`HfUX]hcbU`7i`gtrX]Ubgž`hY`6YXY[U`fP`Ybg]b[hcb`WJa`di`glž;`UX][U`f7`]mUbX`5fhi`8Yg][b`7 Ua`di`gYgŁ`UbX`hY`B[i`bbUk`U`dYcd`Y`f5i`ghfU]Ub`8YZ`bVW`:`cfW`5WUXYa`m]b`7`UbVYffUŁ`cZhY`UbXg`k`YfY`YUW`WJa`di`g`cZI`BGK`]g`cW]hYX"

7ci fgY'8YHJ]`g

7fYX]hDc]bHg '*`

Gi a a UfmcZh\Y'7ci fgY

K \c'XYWjXYg'k \Uhi]g`])hYfUhi fY3'K \c'gY'YWg'k \Uhi]g'U`])hYfUfm'WUgg]W8'<ck 'XcYg`])hYfUhi fY'k cf_]b'U
k cf'X'cZa YX]U'Wb[`ca YfUHyg'UbX'ga U`'cb`]bY'dfYggYg3'F YUX]b['UbX'k f]h]b[`])hYfUhi fY'a UmVY'U

≠!WUgg:[fci d'YI YfW]gYg'hc'k cf_g\cd'fYgYUfVX'a YhcXgž"["VmUbU'mg]b['XUHU!gYhg'cf]bhYfj]Yk g'k]h
]hYfUfmdfUW]h]cbYfg"

H]a Y'U`cWUHX'Zcf'YUW'ghi XYbhlc'cZZf'hY]f'ck b'cd]b]cb

Bc'gYhei Ygh]cbg'Zcf'a U'cf'YggUmhc'YbW'ci fU[Y'ghi XYbhg'hc'fYgYUfVX'hY'hc'd]Wg'k \]W'ia cgh]bhYfYghhYa ž
UbX'hc'dfcj]XY'hYa'k]h'hY'cddcfh b]mhc'a U_Y'hY]f'ck b'cf][]bU`]bhYfj Ybh]cb']b'U'gWc'UfmiXYVUHY

Dcgg]V]]mhc']bhYfj]Yk 'U`]hYfUfmdfUW]h]cbYf

F YU'!k cfX'dfcV'Ya !gc'j]b[. 'hY'W'a V]bU]cb'cZdfUW]W!VUgYX'k cf_'UbX'fYZYW]j Y'UbU'mg]g']b'hY'W'ci fgY

5ggYgga Ybh

5ggYgga YbhHUg_g

5ggYgga YbhHUg_	K Y][\h	8i Y'8UH	Gh XYbh@YUfb]b[Ci Hta Yg'5ggYggYX
A i `hjd`Y`7`c]W`E i Ygh]cb`	&)	Hc `Wta d`YH`YUW`k YY_ VYZ`fY`hY`gYa]bUf	%
hYfj]Yk `5bU`mg]g`UbX E i Ygh]cbg`	')	\$) # \$ + # & \$ \$ % % \$ \$ `DA	%z&Z(
9ggUmi	(\$	%) # \$, # & \$ \$ % % \$ \$ `DA	%z&Z Z(

5ggYgga Ybh8YHJ]`g

5ggYgga Ybh% `A i `hjd`Y`7`c]W`E i Ygh]cb

GHUfhXUH. \$, # \$ * # & \$ \$ % % \$ \$ `5A

8YHJ]`g.

hXj]Xi U`5ggYgga Ybh

&) !dYfWbh

: fca `K YY_`&hc`%\$]bW]g] Yznci `a i ghk f]H`cbY`a i `hjd`Y`Wc]W`ei Ygh]cb`UbX`Ubkg Yf`Uh`YUghZ] Y
ei Ygh]cbg`cb`hY`fYUX]b[g"

: YYXVUW_j]U`@A G"

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

5ggYgga Ybh&. hYfj]Yk `5bU`mg]g`UbX`E i Ygh]cbg

GHUfhXUH. \$, # \$ * # & \$ \$ % % \$ \$ `5A

8YHJ]`g.

hXj]Xi U`5ggYgga Ybh

%) \$ \$ `k cfXg

') !dYfWbh

Hi fb]h]b'gYH]b[. H\]g'Ugg][ba Ybh]g'gi Va]hX'h'fci [\ 'Hi fb]h]b'UbX'gh XYbhg'Xc' bchgYY'Hi fb]h]b
g]a]Uf]mifYdcfrg"

5ggYgga Ybh' . '9ggUm

GHUfhXUHY . '% # \$ + # & \$ & \$ '% & . \$ \$ '5A

8YHU]`g.

ϕX]j]Xi U`UggYgga Ybh

%) \$ \$ 'k cfXg

') !dYfWbh

9ggUmcb'U'hd]WcZmci f'W\ccg]b["Mci 'a i ghWcj Yf'a UHf]U'Zca 'K YY_+']bWi g]j Y'hc '%\$']bWi g]j Y'cb`m
fXc' bchd]W_`i d'U'hd]W\UhWcj Yfg'k YY_`%'hc') E" 'Hc' \Y'd'mci 'dfYdUfY'Zcf'mci f'YggUmz'UbX']b'cfXYf'hc' [Yh
]b]h]U'Z'YXVUW_Z'mci 'UfY'Ug_YX'hc'k f]h'U'&\$ \$!k cfX'UVghfUW'hZcf'h'Y'Wcbj Ybcf" H\]g'g\ci 'X']bWi XY'mci f
dfcdcgYX'h]hYz'UbX'U'XYgW]d]h'cb'cZmci f'hd]WUfYU'UbX'cZ'hY'ei Ygh]cb'XYj]gYX"

H\]g'g'h'Y'Z]bU`UggYgga Ybh'

: YXVUW_k]`VY'dfcj]X'X'j]U'@A G"

Hi fb]h]b'gYH]b[. H\]g'Ugg][ba Ybh]g'gi Va]hX'h'fci [\ 'Hi fb]h]b'UbX'gh XYbhg'Xc' bchgYY'Hi fb]h]b
g]a]Uf]mifYdcfrg"

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'ggi ddcfh4 i bgk "YXi "Ui "'Gi ddcfh
\ci fg'UfY', .\$\$Ua '—%\$.\$\$da 'cb'k YY_XUmg'UbX'-. \$\$Ua '—) .\$\$da 'cb'k YY_YbXg'fl *) 'XUmg'U'm'YUfl" 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 YbHg'k'hc
]bWi XY'Ug'Yj]XYbVW'hc'gi ddcfhmc i f'YI HYbg]cb'Udd'jW]h]cb" Ʒmci 'Ya U] '9I HYfbU'Gi ddcfhmc i 'k]
Ui 'ca UH]WU'm'f'YW]j Y'U'h]W_Yhbi a VYfž'Vi h]Zmci 'HY'Yd\cbY'mci 'k]'b'Y'YX'hc'gd'Y'W]WU'm'Ug_'Zc'f'cbY"
Hi fb]h]b'U'gc'dfcj]XYg'i dXUH'g'cb'H'Y]f'gmgh'Ya 'ghU'hi g'cb'Hk]H'Yf"

; YbYfU'mž'UggYgga YbhiHUg_g'a i ghVY'gi Va]H'YX'Y'Y'W'f'cb]WU'mj]U'Y]H'Yf'Hi fb]h]b'cf'U'A ccX'Y
Ugg][ba YbH' 'b]bg]H'UbVW'g'k \YfY'H'g]g'bc'hd'cgg]V'Yž'hk]'VY'gh'UH'X'cb'mci f'Wci 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 YbHg'cb]bYj]U'A ccX'Y. \H'hdg.#gh XYbH'i bgk "YXi "Ui #ck!
gi Va]hUgg][ba YbH'a 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'h'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'h'X'UgdY'W'g'cZ9@-G9'k]''\Y'd'mci 'a U_Y'h'Y'a cgh'cZ'mci f'gh X]Yg'Uhl BGK ""

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

5 WUXYa]WbZcfa Uh]cb

: cfYggYbh]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 BGK `<YU`h`UbX`GUZ`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

[\ftdg.#k k k "Uftg"i bgk "YXi "Ui #W ffYbhgh XYbh\]UWUXYa \]W\]bZcfa Uh\]cb#dfchW`g!\[i \]XY`\]bYg#](#)

⇒ U[Y`7 fYX]h

6cc_`Vi fb]b[

7F ⇒CG

7F ⇒CG`Dfcj]XYf`7cXY.`\$\$\$- ;

5W_bck`YX[Ya YbhcZ`7ci bhfm

K Y`UW_bck`YX[Y`hY`6YXY[U`dYcd`Y`k `c`UfY`hY`hfUX]h]cbU`W`ghcX]Ubg`cZ`hY`UbXg`cb`k `]W`I BGK
? Ybg]b[`tc`W`a`di`g`]g`c`W`hYX"