



ARTS3484

C b '@c j Y 'UbX': f]YbXg\]d ']b': fYbVX 'HYI hg 'UbX':]`a g

HYfa `Hk c `#`&\$%

7ci fgY`Cj Yfj]Yk

`GHUZZ7cbhUWhi8YHU]`g`

`7cbj Ybcfg`

B Ua Y	9a U]`	5j U]UV]]m	@cWU]cb	D\cbY
@Yg]Y`6YbUX]VU	\U`4 i bgk "YXi "Ui	VmUddc]bħa Ybh	A 6`&++	- ' ,) `&' &%

GW\cc``7cbhUWhi`bZcfa Uh]cb

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

@cWU]cb. `GW\cc``C Z]WžA 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](#)

7ci fgY'8YHJ]`g

7fYX]hDc]bmg`*`

Gi a a UfmicZ\hY'7ci fgY

: fYbW\h'ci [\hUbX'W`h fY\Uj Y'g\UdYX'WfU]b`bch]cbg'cZci f'gcW\Yhm'`b'h]g`Vei fgY'Z'mei`k`]'`gh`XmiHl hg
UbX'Z'a`g`Vmdfca`]bYbhi: fYbW`k`f]hYfg'UbX'Z'a`a`U_Yfg'Z'ca`'hY`&\$h`UbX`#`c`f`&%ghVWbh`f]Yg`]b`c`f`X`Y`f`h`c`
Z`W`g`c`b`X`]Z`Y`f`Y`b`h`d`Y`f`g`d`Y`W`j` Y`g`V`e`b`W`f`b`]b`[`'h`Y`]'b`X`]j`]X`i`U`f`g`'f`Y`'U`h`c`b`g`\]d`h`c`h`Y`f`g`]b`'h`Y`'V`e`a`a`i`b`]m`z`
Y`b`U`V`]b`[`'m`e`i`'h`c`'X`]g`W`g`g`]a`d`c`f`U`b`h`W`'h`f`U`z`g`c`W`U`'U`b`X`'Y`h`]W`'']g`g`i`Y`g`"

HUi [\h]b': fYbW`"

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

%`8`Ya`cbg`h`U`h`'`_`b`c`k`'Y`X`[`Y`'c`Z`g`c`a`Y`]a`d`c`f`U`b`h`i`:`f`Y`b`W`'k`f]h`Y`f`g`'U`b`X`'Z`'a`a`U`_`Y`f`g`
&`" `I`b`X`Y`f`g`h`U`b`X`'d`f`c`X`i`W`j`Y`'k`U`m`g`'h`c`'U`d`d`f`c`U`W`X`'h`Y`l`h`g`'U`b`X`'Z`'a` `"
'`" `8`]g`d`'U`m`U`b`]b`W`Y`U`g`Y`X`'_`b`c`k`'Y`X`[`Y`'c`Z`W`f`f`Y`b`h`Y`h`]W`'U`b`X`'g`c`W`U`'']g`g`i`Y`g`]'b`'h`Y`]f`V`e`a`d`'Y`l`]m`
(`" `8`Ya`cbg`h`U`h`'U`b`]a`d`f`c`j`Y`X`'U`V`]']m`i`h`c`'Y`l`d`f`Y`g`g`'h`Y`g`Y`']g`g`i`Y`g`"

HYUW\]b[`GhfUHy[]Yg`

H\]g`]'g`U`'Y`W`h`f`Y`#`i`h`c`f]U`'V`e`i`fg`Y`'h`U`i`[`\h]b': fYbW`"@YW`h`f`Y`g`'k`]'`d`f`c`j`]X`Y`'V`e`b`h`Y`b`h`z`k`\]Y`'h`h`c`f]U`'g`'k`]'`V`Y`
V`e`b`X`i`W`Y`X`]'b`]'b`h`Y`f`U`W`j`Y`'Z`c`f`a`U`h`h`c`'U`'c`k`'h`Y`'X`]g`W`g`g`]c`b`'U`b`X`]'b`!`X`Y`d`h`'V`e`b`g`]X`Y`f`U`h`]c`b`'c`Z`h`Y`'h`l`h`g`'U`b`X`]'g`g`i`Y`g`
f`U`]g`Y`X`]'b`'h`Y`'V`e`i`fg`Y`" `G`h`X`Y`b`h`g`'U`f`Y`'f`Y`e`i`]f`Y`X`'h`c`'f`Y`U`X`'h`Y`'f`Y`'Y`j`U`b`h`f`Y`U`X`]b`[`g`'V`Y`Z`c`f`Y`'V`e`a`]b`[`'h`c`'Y`W`h`f`Y`g`'U`b`X`
U`f`Y`'Y`l`d`Y`W`Y`X`'h`c`'Z`c`'c`k`'i`d`'k`]h`]'b`X`Y`d`Y`b`X`Y`b`h`f`Y`U`X`]b`[`'U`b`X`'f`Y`g`Y`U`f`W`'c`b`'h`Y`'k`Y`Y`'_`m`i`h`c`d`]W`j`]b`d`f`Y`d`U`f`U`h`]c`b`'Z`c`f`
h`h`c`f]U`'g`" `G`h`X`Y`b`h`g`'U`f`Y`'Y`l`d`Y`W`Y`X`'h`c`'h`U`_`Y`'U`b`'U`W`h`j`Y`'U`d`d`f`c`U`W`X`'h`c`'h`Y`]f`'Y`U`f`b`]b`[`]'b`'U`b`X`'c`i`h`g`]X`Y`'c`Z`W`U`g`g`"
D`U`f`h`j`W`d`U`h`]c`b`]g`'Y`l`d`Y`W`Y`X`'g`c`'h`U`h`_`b`c`k`'Y`X`[`Y`'W`U`b`'V`Y`'g`'U`f`Y`X`'U`b`X`'X`Y`V`U`h`Y`X`"

GhUfhXUHY. 'Bch5dd`]WUV`Y

8YHU]`g. '7 f]h]WU`UbU`mg]g`cZU`dUggU[Y`Zfca`'cbY`cZ`h`Y`h`YI`hg`W`j`Y`f`Y`X`'b`WUgg`k`]h`Uddfcdf]UHY`
V]V`]c[fUd`m`K` f]h`b`ZYXVUW`"

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

H`Y`h`d]WcZ`h`Y`Z]bU`YggUmik`]'`VY`[`j`Yb`]b`WUgg`Vmi`h`Y`Y`W`h`f`Y`f`H`Y`YggUm]g`Xi`Y`cb`%`#`\$,`#`&`\$`%-`Z`h`Y`
Z]fghXUmcZ`h`Y`YI`Ua`'g`Ygg]cb`"'`#`i`a`i`gh`VY`gi`Va`]h`Y`X`h`f`ci`[`\`Hi`fb]h]b`"H`Y`YggUmig`ci`X`X`Y`a`cb`g`h`f`U`h`
cbY`g`UV`]'h`m`h`c`h`b`_`h`f`ci`[`\`U`h`d]WUbx`YI`df`Ygg`cbY`g`h`ci`[`\`hg`]b`U`WYUfz`[`f`Ua`a`U`h]W`m`U`W`W`f`U`h`z`U`b`X`
W`c`Y`f`Y`bh`k`Umik`]h`U`c`[`]W`m`g`h`f`i`W`h`f`Y`X`Y`j`Y`c`da`Y`b`h`H`Y`YggUm]g`k`f]h`b`]b`':`f`Y`b`V`X`"

Hi`fb]h]b`g`Y`h]b[.`H`Y`g`Ugg][`ba`Y`bh]g`gi`Va`]h`Y`X`h`f`ci`[`\`Hi`fb]h]b`Ub`X`gh`XY`bh`g`W`U`b`g`Y`Y`Hi`fb]h]b`g]a`]`U`f]m`
f`Y`d`c`f`g`"

K YY_-'&-'>i`m!`& 5i [i gh	@YWhi fY	Ghi XmicZHY`WXUfUWYfg`UbX`UbU`mg]g`cZHY`hYa Yg]b`"@U`J`jY`XYj Ubhgc]"
	Hi hc.f]U`	5WVj`]h]Yg`fY`UHfX`hc`hY`"YWhi fY"
K YY_`%\$.)`5i [i gh!`- 5i [i gh	@YWhi fY	@U`J`jY`XYj Ubhgc]`.i bXYfgfUbX]b[`hY`a YUb]b[`cZ hY`hYI h
	Hi hc.f]U`	: YYXVUW`cb`HYgh& 5WVj`]h]Yg`fY`UHfX`hc`hY`"YWhi fY"

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

"@U`J]Y`XYj Ubhgc]"zVmF ca U]b"; Ufm#9a]Y`5`Uf"Di V`]g\Yf`6Y`]b`!"; U`]a UfX`f&) `Uc`xh&\$-\$- L`f&) * `dU[YgE"

"5Xc`d\Y`zVm6Yb`Ua]b`7 cbghUbf5`dXZj Yfg]cb`k]`VY`Uj U]UV`Y`Ug`hY`Vcc_`]g`]b`hY`di V`]WXca U]bE"

H\Y`a`cj]Y`"@U`VY`Y`Yh`U`VA`H`Y`k]`VY`Uj U]UV`Y`]b`j]XYc`UbX`8J`8`Zcfa`UhZcfa`hY`I`BGK`"]VfUfmUbX`#cf`cb`]bY`j]U`@Y[Ubtc"

F YWca a YbXYX`F Ygci fWg

"5Xc`d\Y`zVm6Yb`Ua]b`7 cbghUbf"Di V`]g\Yf`. @Y`@j fY`XY`DcW\Y`f%Uj f]`%` , , L`f&%- `dU[YgE

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

7ci fgYg`UFY`dYf]cX]WU`mfYj]Yk YXz`UbX`gh`XYbfg`ZYXVUW`]g`i`gYX`hc`]a`dfcj`Y`hYa`":`YYXVUW`]g`[`Uh`YfYX`Zcfa`gh`XYbfg`i`g]b[`a`m9I`dYf]YbW`" #i]g`YbVci`fU[`YX`gh`XYbfg`Wca`d`YH`hY]f`gi`fj`Ymg`Vm`UW`Y`gg]b[`hY`dYfgcbU`]gYX`k`YV`]b`_`j]U`hY`A`ccX`Y`Wci`fgY`g]hY"

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

Gi Va]gg]cb`cZ5ggYgga YbhHUg_g

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

≠mci `YbWci bhYf`U`dfcV`Ya `k \Yb`U`H`Ya dh]b[`hc`gi Va]hmc`i f`Ugg][ba YbhHfci [\`Hi fb]h]b`z`d`YUgY
H`Y`d`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`Y`UfL`≠mci
UfY`i bUV`Y`hc`gi Va]hmc`i f`Ugg][ba YbhXi Y`hc`U`ZU` `hk]H`Hi fb]h]b`mci `a UmiUdd`miZc`f`Ub`YI H`bg]cb`z`Vi hmc`i
a i ghfY`H]b`mci f`h]W`Yhbi a VYf`Z`ca `9I H`fbU``Gi ddcfhfU`cb[`k]H`Ubmc`H`Yf`fY`Yj UbhXcW a Yb`hgL`hc
]bWi XY`Ug`Yj]XYbW`hc`gi ddcfhmc`i f`YI H`bg]cb`Udd`]W]h]cb"≠mci `Ya U]`9I H`fbU``Gi ddcfhmc`i `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.

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[Ygž UfhUbX`XYg][b`dfc`YWgž`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 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["

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`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][\hžI BGK 'Gh XYbh7cXY'cZ7cbXi W'Ubx'5Ww'dhUV'Y'I gY'cZ I BGK '⇒H'F'Ygci f'W'g'Dc`]Wm
- VY'Uk UfY'cZ'Y'ghUbxUfXg'cZVY\Uj]ci f'YI dYW'X'cZYj Yfmcby`]b'h'Y'I BGK 'Wc'a a i b]m
- `cWJH'gYfj]W'g'UbX'j]bZcfa 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'Yfg'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 ""

[\hd. #gj V'Y'W'f i \]X'Y'g"\]VfUfm'i bgk "YXi "Ui #' \]gY#J'Vci h' \]gY](#)

5 WUXYa]WbZcfa Uh]cb`

: cfYggYbh]U`ghi XYbh]bZcfa Uh]cb`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]m]UbX`X]gUV`]m/
- UbX`chYfYggYbh]U`UWUXYa]W]bZcfa Uh]cbz`gYY

[\hhdg.#k k k "Ufng"i bgk "YXi "Ui #W ffYbhghi XYbh\]bZcfa Uh\]cb`dfc\]Vc`g!\[i \]XY`\]bYg#](#)

⇒ U[Y`7 fYX]h

GmbYf[]Yg`]b`Gci bX`&\$%*`

7F ⇒ CG

7F ⇒ CG`Dfcj]XYf`7 cXY. '\$\$-\$, ;