



# ARTS3052

9b[ `]g\ ` ðhY fbg\]d

GYa YghYf`Hk c ``##`&\$%

GWcc``cZHAY`5ftg`UbX`A`YXJU``#`I`BGK``5ftg`UbX`GcWJU``GWYbWg



7ci fgY`Cj Yfj ]Yk

`GHUZZ7cbhUW`i8YHJ]`g`

`7cbj Ybcfg`

|                                |                        |                                |                                       |       |
|--------------------------------|------------------------|--------------------------------|---------------------------------------|-------|
| B Ua Y                         | 9a U]`                 | 5j U]`UV]`]m                   | @cWU]hcb                              | D\cbY |
| F Ua Ugk Ua ]<br>< Uf]bXfUbuUk | f"\Uf]4 i bkg "YXi "Ui | H\i fgXUmj<br>- "" \$!%\$"" \$ | &&&ž`@Yj Y``&ž<br>F cVYfh<br>K YVghYf |       |

GVXcc`7cbhUW`i`bZcfa Uh]cb

Fcca " %&ž`Yj Y`` F cVYfhK YVghYf`6i ]X]b[

D\cbY. f\$&ž`- ' , ) ( , ) \*



7ci fgY'8YHJ]`g

7fYX]hDc]bqg`\*`

Gi a a UfmicZ\hY'7ci fgY

Gi VYWh5fYU.'7`Y[eZ

H\]g`Wci fgY'dfcj ]XYg'mci `k ]h`Ub'cddcfh b]hmc'i bXYftU\_Y`k cf\_! ]bhY[ fUHx`YUfb]b[ `UbX'[ U]b`]bXi gHfm  
YI dYf]YbW`k ]h`U`cgHcf[ Ub]gU]cb`WcgY`mfY`UHx`hc`mci f`A U`cf`]b`9b[ `]g\`"Mci `a UmU`gc`Udd`mhc`k cf\_  
cb`UHUW`a Ybhc`b`Ub`UWXYa ]WfYgYUfW`dfc`YW`ic`k cf\_]b`Ub`YX]hc]U`fc`Y`Zc`f`Ub`UWXYa ]W`ci fbU`"  
=XYU`nZ`mci `k ]`i bXYftU\_Y`Ub`]bhYfbg\]d`UZh`f`mci `Uj`Y`W`a d`Y`H`X`%)`mYUfg`cZ`Z`!`h`a`Y`gh`Xmfc`f  
Yei ]j`U`Y`b`h`Ub`X`W`a d`Y`H`X`U`a ]b]a`i`a`c`Z`%`!`C`7`]b`h`Y`A`U`cf`"5`h`h`Y`Y`b`X`c`Z`h`Y`]bhYfbg\]d`mci `k ]`  
dfcj ]XY`U`gi`a`a`U`h`j`Y`fYdc`fhc`Z`mci`f`YI`dYf]YbW`g`Ub`X`k`cf`\_YI`Ua`d`Y`g`W`a`d`Y`H`X`Xi`f]b[ `h`Y`]bhYfbg\]d`"

H\Y`]bhYfbg\]d`f`Yei ]fYg`U`hc`U`W`a`a`]h`a`Ybhc`Z`\$`\$`!`%`\$`\\ci`fg`c`Z`k`cf`\_k`]h`U`cgHcf[ Ub]gU]cb`Ub`X`a`Um  
bcfa`U`m`V`Y`h`U`\_`Y`b`]b`Z]fgh`z`g`Y`W`b`X`c`f`gi`a`a`Y`f`g`Y`a`Y`gh`Y`f`"b`h`Y`fbg\]d`cddcfh`b]h]Yg`UfY`UX`j`Y`fh]g`Y`X`j`]U`h`Y  
G`W`cc`c`Z`h`Y`5`f`g`\_`Ub`X`A`Y`X]U`b`h`Y`fbg\]d`B`Y`k`g`Y`H`Y`f`"5`h`Y`fb`U`h`j`Y`m`mci`a`Um`Udd`fc`U`W`U`f`Y`Y`j`Ub`h  
cf[ Ub]gU]cb`hc`Udd`m`Zc`f`Ub`]bhYfbg\]d`"D`f]c`f`hc`g`Y`Y`\_]b[ `Ub`]bhYfbg\]d`z`mci`g`\\ci`X`U`H`Y`b`X`Ub`]bhYfbg\]d`  
]b`Zc`fa`U`h]cb`g`Y`gg]cb`fi`b`V`m`h`Y`G`W`cc`c`Z`h`Y`5`f`g`\_`Ub`X`A`Y`X]U`"

Hc`V`Y`Y`][ ]V`Y`Zc`f`h`]g`W`ci fgY`z`mci `a`i`gh`U`j`Y`U`a`]b]a`i`a`K`5A`c`Z`+`\$`"

5h`h`Y`W`b`W`i`g]cb`c`Z`h`]g`W`ci fgY`h`Y`g`h`X`Y`b`h`k`]`V`Y`U`V`Y`hc`

%`\\U`j`Y`[ U]b`Y`X`YI`dYf]YbW`c`Z]bXi`ghfmdfc`W`gg`Y`g`Ub`X`df`U`W`]W`g  
&`"Udd`m`h`Y`c`f`Y`h]W`W`W`b`W`d`f`g`\_`g`[ U]b`Y`X`]b`h`Y`d`f`c[ fUa`hc`fYU`!`k`c`f`X`W`b`h`YI`h`g  
'`"\\U`j`Y`Y`b`\\Ub`W`X`h`Y]f`W`Ud`U`W`]m`Zc`f]b`X`Y`d`Y`b`X`Y`b`h`Y`b[ U[ Ya`Y`b`h`k`]h`]b`Xi`ghfmdfcj ]XY`fg`

HYUW`X`]b[ `G`h`f`U`H`Y`[ ]Y`g`

H\]g`W`ci fgY`\\U`g`bc`Zc`fa`U`h`Y`U`W`X`]b[ `W`a`d`cb`Y`b`h`"

# 5ggYgga Ybh

5ggYgga YbhHUg\_g`

|                     |          |                 |  |
|---------------------|----------|-----------------|--|
| 5ggYgga YbhHUg_     | K Y][ \h | 8i Y'8UHŸ       | Gh XYbh@YUfb]b[<br>Ci hWca Yg'5ggYggYX |
| 7 f]h]WU`F YZYW]cb` | ) \$i    | &*`C WcVYF`&\$% | %ž&                                    |
| K cf_`9j ]XYbW`     | ) \$i    | &*`C WcVYF`&\$% | %ž                                     |

# 5ggYgga Ybh8YHU]`g

5ggYgga Ybh%`f]h]WU`F YZYW]cb`

GHUfhXUHŸ.`

8YHU]`g. `Gh XYbŸg`k ]`gi Va ]hU`W]h]WU`F YZYW]cb`k \]WVf]YZmXYg\$ Yg`hY`hmdY`cZcf[ Ub]nUH]cb`hYmk YfY d`UW`X`]b`UbX`hY]f`c`Y`k ]h]b`]h]XYbh]Z]Yg`U`fY`Yj`Ubhfc`Y`]b`hY`cf[ Ub]nUH]cb`Uhc`f`WcgY`h`fY`b]f`m`f`i`Yj`Y`UbX`hY`g`\_`g`UbX`Uh` i`hYg`bY`Y`X`Y`X`h`c`Wca`d`Y`H`gi`W`U`f`c`Y`U`X`X`f`Y`g`g`Y`g`l`c`k`h`Y`h`m`d`Y`c`Z`k`c`f`\_`h`Y`m`l`U`j`Y`i`b`X`Y`f`U`\_`Y`b`#`d`f`c`X`i`W`X`X`i`f`b`[`h`Y`]`f`d`U`W`a`Y`b`h`W`c`b`h` i`h`Y`g`h`h`Y`]`f`c`g`h`c`f`[`Ub]nUH]cb`UbX`#`c`f`f`Y`j`Ubh`]b`X`i`g`f`m`#`h`]g`U`gh`Wca`d`c`b`Y`b`h`g`h`i`X`Y`b`g`g`l`c`i`X`Y`l`d`]m`h`m`f`Y`Z`Y`W`i`c`b`g`i`W`Z`U`W`c`f`g`U`g`h`Y`l`c`g`h`#`b`X`i`g`f`m`U`[`Y`b`X`U`ž`W`U`\_`Y`b`[`Y`g`UbX`]bb`%` Ž`c`f`h`Y`l`c`g`h`#`b`X`i`g`f`m`ž`ei`Y`g`%` Ž`c`Z`Y`h`]W`g`k`l`W`a`U`m`U`h`c`h`]g`k`c`f`\_`ž`ei`Y`g`%` `c`Z`]b`X`i`g`f`m`g`h`U`b`X`U`f`X`g`ž`]b`X`i`g`f`m`d`f`c`W`g`g`Y`g`c`f`a`Y`X`]U`Ž`c`f`a`g`"5`W`X`Y`a`]W`f`Y`Z`f`Y`b`W`

Gi Va ]gg]cb'cZ5ggYgga YbhHUg\_g

Gh XYbng'UFY'YI dYW'X'hc'di h'AY]f'bUa Yg'UbX'ghi XYbhbi a VYfg'cb'Yj YfmdU[ Y'cZ'AY]f'Ugg][ ba Ybng"

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

Zmci 'YbWci bhYf'U'dfcV'Ya 'k \Yb'U'HYa dh]b[ 'hc'gi Va ]hrci f'Ugg][ ba Ybh'fci [ \ 'Hi fb]h]bzd'YUgY  
HY'Yd\cbY'9I HYfbU'Gi ddcfhcb'-', ) '' '' '%cf'Ya U]'h'Ya 'cb'[YI HYfbU'HY'fji ddcfh i bgk "YXi "Ui."](#)Gi ddcfh  
\ci fg'UFY', .\$\$Ua '-'%. \$\$da 'cb'k YY\_XUmg'UbX'-. \$\$Ua '-'). \$\$da 'cb'k YY\_YbXg'f1 \*) 'XUmg'U'mYUfL" Zmci  
UFY'i bUV'Y'hc'gi Va ]hrci f'Ugg][ ba YbhXi Y'hc'U'ZU'i 'hk ]h'Hi fb]h]b'mci 'a UmiUdd'miZcf'Ub'YI HYbg]cbz'Vi hrci  
a i ghfYh]b'mci f'h]W\_Yhbi a VYf'Z'ca '9I HYfbU'Gi ddcfhfU'cb[ 'k ]h'Ubmc'h'Yf'f'Yj UbhXcW a Ybng'hc  
]bWi XY'Ug'Yj ]XYbW'hc'gi ddcfhrci f'YI HYbg]cb'Udd'jW]h]cb" Zmci 'Ya U]'9I HYfbU'Gi ddcfhrci 'k ]`  
Ui 'ca U]W]m'fYW]j Y'U'h]W\_Yhbi a VYfz'Vi h]Zmci 'HY'Yd\cbY'mci 'k ]`b'YX'hc'gdYW]W]m'Ug\_'Zcf'cbY"  
Hi fb]h]b'U'gc'dfcj ]XYg'i dXUHYg'cb'h'AY]f'gmghYa 'ghU'h'g'cb'Hk ]HYf"

; YbYfU'mz'UggYgga YbhHUg\_g'a i ghVY'gi Va ]HYX'Y'YWfcb]W]m'j ]U'Y]h'Yf'Hi fb]h]b'cf'U'A ccX'Y  
Ugg][ ba Ybh' b ]bg'U'bw'g'k \YfY'h'lg ]g'bchidcgg]V'YZ]hk ]`VY'g'U'HYX'cb'mci f'Wci fgY'g'A ccX'Y'g]HY'k ]h  
U'HYfbU]j Y'gi Va ]gg]cb'XYh]g"

@UH'5ggYgga YbhDYbU'h]Yg

- K cf\_gi Va ]hYX`%\$`hc`%-`XUmg`UZhf`h`Y`gh]di`UH`X`XYUX`]bY`k`j`VY`UggYggYX`UbX`ZYXVUW`dfcj`]YX`Vi`hU`a`Uf`\_`cZnYfc`k`j`VY`fYW`fYX`" `Z`h`Y`k`cf`\_`k`ci`X`U`j`Y`fYW`]j`YX`U`dUgg`a`Uf`\_`Vi`hZ`f`h`Y`U`h`b`Y`gg`UbX`h`Y`k`cf`\_`]g`U`W`a`di`gc`fm`W`i`fg`Y`W`a`dcb`Y`bh`f`i`f`X`Y`f`Y`ei`]f`Y`a`Y`b`h`Z`U`g`h`X`Y`bh`k`]`VY`X`Y`a`Y`X`h`\_`U`j`Y`a`Y`h`h`U`h`f`Y`ei`]f`Y`a`Y`bh`/`
- K cf\_gi Va ]hYX`&\$`cf`a`cf`Y`XUmg`UZhf`h`Y`gh]di`UH`X`XYUX`]bY`k`j`bch`VY`U`W`W`d`h`X`Z`f`UggYgga`Ybh`UbX`k`j`fYW`]j`Y`bc`ZYXVUW`z`a`Uf`\_`cf`[`f`U`X`Y`" `Z`h`Y`UggYgga`Ybh`U`g`\_`]g`U`W`a`di`gc`fm`W`a`dcb`Y`bh`c`Z`h`Y`W`i`fg`Y`U`g`h`X`Y`bh`k`]`f`Y`W`]j`Y`Ub`l`bg`U`h`g`Z`U`W`c`fm`: `U`]`f`l` : `E`[`f`U`X`Y`U`g`U`f`Y`gi`h`c`Z`i`bg`U`h`g`Z`U`W`c`f`m`d`Y`f`Z`c`fa`Ub`W`]b`Ub`Y`gg`Y`bh`]U`W`a`dcb`Y`bh`c`Z`h`Y`W`i`fg`Y`"

H\]g`]bZ`c`fa`U`h`c`b`]g`U`g`c`U`j`U`]`\$

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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`Ub[ ]b[ `U`ZYk `k cfXg`UbX`d`fUgYg`k \]Y`a cghmifYU]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



- i bXYfghUbx'mci f'f][ \hg'UbX'fYgdcbg]V] ]hYg'Ug'U'gh XYbhUhl BGK
- VY'Uk UfY'cZd'U[ ]Uf]ga ž'Wcdmf][ \hžI BGK 'Gh XYbh7cXY'cZ7cbXi WñUbX'5WwdfUV'Y'I gY'cZ I BGK '⇒H'F Ygci fW'g'Dc`]Wñ
- VY'Uk UfY'cZñY'ghUbXUfXg'cZVY\Uj ]ci f'YI dYWñX'cZYj Yfmcby' ]b'hY'I BGK 'Wca a i b]m
- `cWñh'gYfj ]Wg'UbX' ]bZcfa Uhcb'UVci hl BGK 'UbX'I BGK '@]VfUfm

Gca Y'cZñYgY'UfYUg'k ]`VY'ZJa ]]Uf'hc'mci žcñYfg'k ]`VY'byk "; U]b]b[ 'U'gc`X'i bXYfghUbx]b[ 'cZU`ñY fY'UH'X'UgdYWñ'cZ9@G9'k ]`Y'd'mci 'a U\_Y'hY'a cghcZmci f'gh X]Yg'Uhl BGK "

[f\hñ.#gi.VYWñ\[i\]XYg"\]VfUfm'i bgn"YXi "Ui #'\]gY#UVci h' \]gYŁ](#)

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

BchUj U]UV`Y

F YWca a YbXYX`F Ygci fWg

BchUj U]UV`Y

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

Øf]YZmci h]bY`\ck`gh`XYbhZYXVUW`fVch`Zcfa U`UbX`]bZcfa U`E`cb`hY`Wci fgY`k`j`VY`[ U`hYfYXž`\ck`]h`k`j`VY`UbU`mgYX`UbX`\ck`]hk`j`VY`UWYX`i`dcb`hc`]a`dfcj`Y`hY`gh`XYbh`YUfb]b[ `Yl`dYf]YbW`": cf`Yl`Ua`d`Yž`mci`a`][`hX]gW`gg`k`h`Uk`Ug`]XYbh]ZYX`]b`dUghZYXVUW`UbX`\ck`h`]g`Wci fgY`k`Ug`W`Ub[ YX`hc`UXXfYgg`hY`]ggi`Y"Q

⇒ U[ Y`7 fYX]h

6cX]Yg/`hYfZUWg`&\$%\*

7F ⇒ CG

7F ⇒ CG`Dfcj`jXyf`7cXY`.\$\$\$-` ;