



ARTS1190

GmXbYm' <]ghc fnž' @UbXgWJdYgž' DYcd'Y

HYfa 'H\fYY'##'&\$&\$

7ci fgY`Cj Yfj]Yk

GHJZ`7cbHJW`8YHJ`g

7cbj Ybcfg

B Ua Y	9a U]	5j U]UV]]m	@WJhcb	D\cbY
>Ua Yg`?YUhb[^_YUhb[4 i bgk "YXi "Ui	Ya U]`Zcf Uddc]bha Ybh	A cfj Yb`6fck b &, \$	

GWcc``7cbHJW`bZcfa Uh]cb

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

@WJhcb. `GWcc``C ZWZA 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]bhg`*`

Gi a a UfmcZhY'7ci fgY

H\]g`Wci fgY`ja a YfgYg'mci`]b`hY`\]ghc'fmž'dc`]h]Vg`UbX`W`hi fY`cZGmXbYmiUbX`h\fc [\`h\Ya ž]b\fcXi Wg'mci

8YHJ]g.

6)V`c[fUd\mWta df]gYg`U`]ghcZ%\$[ccX`ei U`]mngci fWg`Zcf`hY`a U`cf`dfc`YW`5Vci h) \$\$`k cfXg"

⊖X]j]Xi U`ZYXVUW`Vmfi Vf]Wd`i g`bi a Yf]WJ`[fUXY"

5XX]h]cbU`XYHJ]g.

H\]g`Ugg][ba Ybh]g`hc`a U`Y`gi fY`mci `UFY`k cf_]b[`hck UfXg`mci f`A U`cf`G]H`!VUgYX`dfc`YW`h]UggYgga Ybh
'`L`UbX`cb`h]UW`hc`Wta d`Yh]b[`]h`hc`U`\][\`g`h]UbXUfX"⊖]h`mci `k`]`b`Y`Y`X`hc`dfcj]XY.

%` 5`g`m`b`c`d`g]g#UVghfUW`h`H\]g`]g`U`g`c`f`h]fU`Vci h` \$\$`k cfXgž)!*`g`Y`b`h`Y`b`W`g`E`gi a a UfmidfYgYbh]b[
mci f`c] YfU`Uf[i a Ybh]f`h]Yg]g`h`U`h`mci `k`]`V`Y`Uf[i]b[`]b`mci f`a U`cf`dfc`YW`Mci `k`]`ci`h]bY`k` \m
mci f`W`c`g`Y`g]h`Y`]g`g][b]Z]W]b]h]k` \U]h]h]h`g`i`g`U`Vci h`G`m`X`b`Y`m`U`b`X`]h]g`]g]h`c`f`m`a` c`f`Y`[Y`b`Y`f`U`n]ž
k` \U`h`Y`j` Y`b`h]ž`h`Y`a` Y`g]ž`d`f`c`W`g`g`mci `Z`Y`Y`h`Y`g]h`Y`a`][\`h]f`Y`d`f`Y`g`Y`b]h]Y`h`W`Mci `k`]`U`g`c`b`Y`Y`X`hc`ci`h]bY
h`Y`U`d`d`f`c`U`W`mci `k`]`V`Y`h]U_]b[`]b`h`Y`fa`g`c`Z`a`Y`h`c`X`g]ž`U`f`Y`U`g`c`Z`c`W`g`f`Y`["ž`g`c`W]U`[fci dgž\]g]h`c`f]WJ`
d`Y`f]c`X`g`Y`h`W`K`f]h]b[`h]g]U`V`g`h]f`U`W`h`k`]`Y`d`mci `hc`V`Y`W`Y`U`f`U`b`X`gi`W]b]W]h]U`Vci`h`mci`f`U`f[i a Ybh]UbX
Z`c`W`g"

&" 5`V]V`c[fUd\nžWc]bg]gh]b[`cZ`
%` Df]a UfmGci fWg.`5`]ghcZU`a]b]a i a `cZ`X`g`d`gci fWg`f`a U`h`Y`f]U`ž`k`f]h]Y`b]ž`U`f`W`Y`c`c[]WJ`

ǂXj]Xi U`ZYXVUW`Vmfi Vf]Vžk f]hYb`Vč a Ybhd`i g`bi a Yf]WU`[fUXY"

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

H\]g`UggYgga YbhfYei]fYg`h`fYgYUfW`UbX`k f]hY`U`dfc`YWhcb`Ub`]a dcfU`bhd`UW`žg]hY`cf`bY][\Vci f\ccX`]b GmXbYm`H\]g`]g`hY`a U`cf`d]YW`cZk cf`_`Zc`f`h\]g`Vč i fgYž`UbX`k \YfY`mci `WU`b`XYa cbghfU`hY`mci f`fYgYUfW`ž UbU`m]WU`ž`hY`cfY`h]WU`UbX`]b`hY`fd`fY`h] Y`g`_`g"

7 \ccgY`CB9`cZ`hY`Z`ck]b[`g]hY`g`f]Z`hY`fY`]g`gca Yk \YfY`Y`gY`mci `k`ci`X`_]Y`h`c`k`cf`_`cbž`d`Y`UgY`Ya`U] a`Y`]b`UXj`UbW`gc`h`Uh`=WU`b`Uddfcj`Y`]h`

- F YXZYfb`fH\Y`6`cW`_`
- @U`DYfci`gY
- A`cf`h`Ufm`G`h]h]cb`UbX`#`f`F`cc`_`k`ccX`7`Ya`Y`hY`fm
- <`mXY`DUf`_`6`UffUW`g
- H\Y`<`mXY`DUf`_`7`YbchUd\
- A`Uff]W]j`]`Y
- 7`UVfUa`U`hU
- 7`i`gh`ca`g`<`ci`gY
- 6`chU`b]W;`UfXYbg
- A`i`gY`i`a`c`Z`G`mX`b`Y`m
- 7`cW`U`h`c`c`_`g`UbX
- DUffUa`U`hU`fY`gd`" `hY`W`a`Y`hY`fm`_`
- 6`cbX]`6`Y`U`W`X
- ?`]b[`g`7`fc`gg
- 8`Uf]b[`\`i`fgh;`Uc`

Mci`a`i`ghj`]g]h`hY`d`UW`mci`UfY`k`f]h]b[`U`Vci`hž`gc`mci`f`fYgYUfW`a`i`gh]bW`i`XY`U`h`Y`U`gh`cb`Y`j`]g]h`h`mci`f`g]hY`f]b]c`f`d`Uf`h`h`Y`fY`c`Z`" `ǂ`mci`f`Ugg][`ba`Y`bž`mci`a`i`gh]bW`i`XY`U`d`l`ch`c`c`Z`mci`fgY`Z`U`h`h`Y`g]hY`h`d`fcj`Y`h`U`h`mci`k`YfY`h`YfY`"

Mci`f`d`fc`Y`W`h`g`l`ci`X`f`b`ch`b`Y`W`gg`Uf]`m]b`h`]g`c`f`XY`f`_`

- 8`Y`g`W]VY`h`Y`g]hY`/`
- C`i`h]bY`h`Y`h`]g`h`c`f`m`c`Z`h`Y`g]hY`ž`gY`h`k`]h]b`k`]XY`f`h`]g`h`c`f]WU`V`č`b`hY`I`h`g`UbX`h`Y`a`Y`g`/`
- 9`I`d`c`fY`k`h`U`h`h`Y`g]hY`hY`g`i`g`U`Vci`h`h`Y`d`Y`f]c`X`]b`k`h`]W`h`k`U`g`Vi`]h`c`f`W`Y`U`h`X`ž`UbX`k`h`U`h]h`hY`g`i`g`U`Vci`h`h`Y`h`]g`h`c`f`m`c`Z`h`Y`W]m`c`j`Y`f`U`" `H\]g`V`č`a`d`cb`Y`b`h`U`c`k`g`mci`h`c`XY`j`Y`c`d`W]h]WU`UbX`UbU`m]WU`ei`Y`g`h]c`bg`U`Vci`h`mci`f`g]hY`/`

a UHf]U`Zcf]Hfg`k]`j UfmžVi hV]V`c[fUd\]Yg`g\ci `X`WēbH]b`U`a]b]a i a `cZY][\hgi VghUbh]U`fYZfYbVW`g"

H\Y`i gY`cZgca Y`df]a Ufm]ci fVW`g`]g`gfcb[`mYbWēi fU[YX`!`k`Y`k]`X]gW`gg`\ck `hē`fYUX`UbX`UbU`mgY`
h\YgY`cj Yf`h\Y`Wēi fgY`cZh\Y`h`fa "

Hi`fb]h]b`gYH]b[.`H\]g`Ugg][ba`Ybh]g`gi Va]H\X`h`fci [\`Hi`fb]h]b`UbX`ghi XYb]g`WUb`gYY`Hi`fb]h]b`g]a]`Uf]m`
fYdcf]g"

5 HbXUbW F Yei JfYa Ybhg

Gh XYbhg UfY ghfc b[mYbWci fu[YX hc UHbX U WUggYg UbX fYj JYk YWfi fY fYWcfX]b[g"

7 ci fgY GWXYXi Y

[J JYk WUgg ha YhUVY](#)

Hja YhUVY

8UhY	HmdY	7cbhYbh
K YY_%%(GYdhYa VYf! %GYdhYa VYf	@YWhi fY	7ci fgY ðhfcXi Wjcb. 7cbj JWhHck b'hc'; `cVU`7]m
	GYa JbUf	ðhfcXi Wjcb. K \Uh]g'Mci f'GmXbYmß
K YY_&.&%GYdhYa VYf! &)GYdhYa VYf	@YWhi fY	Cb]bY @YWhi fY. '5Vcf][JbU`@UbXgWUdYg'cZGmXbYm
	GYa JbUf	; cj Yfbcf'D\]]d'UbX'hAY'9cfU'B Uqcb
K YY_" .&,'GYdhYa VYf! &C WcVYf	: JYXk cf_	9I d'cf]b['hAY'7cbj JWhfHck b
	GYa JbUf	D'YUgY'Xck b'cUX'hAY'I BGK 'K U_]b['Hci f/Zcf'hAY "9I d'cf]b['7cbj JWhGmXbYm'hc' fzi gY'hAY Wci dcb WcXY. '6<G&HG'UbX'hAY'UWwci bhYa U]. \U'4 i bgk "YXi "Ui " ⊕chY. 'h.]g'hU_Yg'hAY'd'UW'cZmci f'YWhi fY'h.]g'k YY_C
K YY_(.)'C WcVYf!'-' C WcVYf	@YWhi fY	Cb]bY @YWhi fY. '6cca '7]mž; YbXYfYX'7]m
	GYa JbUf	K ca Ybfg'D'UW'Jb'hAY'7]m
K YY_) .%&'C WcVYf!'%'* C WcVYf	5ggYgga Ybh	A U'cf'9ggUmUbX'6]V]c[fUd\mXi Y: f]XUm %*'C WcVYf''
	@YWhi fY	Cb]bY @YWhi fY. 'F JWX'GmXbYmž Dccf'GmXbYm
	GWYYb]b[D'YUgY'k UHw 'fD'Um]b['Jb'hAY'G\UXck gfif&\$\$, L']b mci f'ck b'hja Y'f]b_ 'Uj U]UVY'h'fci [\A ccX'YŁ
	Cb]bY'5Wij]m	

F Ygci fWg

DfYgWf]VYX`F Ygci fWg`

5`Wci fgY`fYUX]b[g`k]`VY`Uj U]UV`Y`cb`A ccX`Y`j]U`@[Ubr`c`Z`UXX]hcbU`a UHf]U`Zcf`X]gW gg]cb`]b
gYa]bUfg#Z]bh`fYghZcf`Ugg][ba`Ybhg`k]`VY`dcghYX`k`YY`_m`

F YWca a YbXYX`F Ygci fWg

B #5

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

H\]g`]g`h`Y`gYWcbX`h]a Y`h\]g`i`b]h]g`VY]b[`hU[\h`z`gc`k`Y`UFY`YU[Yf`tc`fYW]j`Y`mc`i`f`ZYXVUW`_j`]U
a`m9l`dYf]YbW`"

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`Ybhi`h`fci`[`\`Hi`fb]h]b`z`d`Y`Ug`Y`
HY`Yd`\\cb`Y`9I`HY`fb`U`Gi`ddc`fh`cb`-`,`)`"``'``%`cf`Ya`U]`h`Ya`i`cb`YI`HY`fb`U`HY`hgi`ddc`fh`4`i`bgk`"YXi`"Ui`""Gi`ddc`fh`
\\ci`fg`UfY`,`.\$\$Ua`-`-%\$.\$\$da`i`cb`k`YY`_X`Umg`U`bX`-`.\$\$Ua`-`).\$\$da`i`cb`k`YY`_Y`bX`g`f`l`*)`X`Umg`U`m`Y`U`f`l`"Ʒmci`
UfY`i`b`UV`Y`hc`gi`Va`]hmc`i`f`Ugg][`ba`Ybhi`Xi`Y`hc`U`Z`Ji`h`k`]h`Hi`fb]h]b`mci`i`a`Um`U`dd`m`Z`c`f`U`b`YI`HY`bg]cb`z`Vi`hmc`i`
a`i`gh`f`Y`h]b`mci`f`h]W`Y`hbi`a`VY`f`Z`ca`9I`HY`fb`U`Gi`ddc`fh`f`U`cb[`k`]h`U`b`m`c`h`Y`f`f`Y`Y`U`b`h`X`c`W`a`Y`b`h`g`k`h`c`
]b`Wi`XY`U`g`Y`j`]X`Y`b`W`hc`gi`ddc`fh`mci`f`YI`HY`bg]cb`U`dd`]W`h]cb`"Ʒmci`Ya`U]`9I`HY`fb`U`Gi`ddc`fh`mci`k`]`
Ui`h`ca`U`h]W`U`m`f`Y`W`]j`Y`U`h]W`Y`hbi`a`VY`f`z`Vi`h]Z`mci`HY`Yd`\\cb`Y`mci`k`]`b`Y`Y`X`hc`gd`Y`W`Z]W`U`m`U`g`_`Z`c`f`c`b`Y`"
Hi`fb]h]b`U`gc`d`fc`j`]X`Y`g`i`d`X`U`h`Y`g`c`b`h`Y`]f`g`m`g`h`Y`a`i`g`h`U`h`g`c`b`H`k`]h`Y`f`"

;`Yb`Y`f`U`m`z`U`gg`Y`g`g`a`i`gh`V`Y`gi`Va`]h`Y`X`Y`Y`W`f`c`b]W`U`m`j`]U`Y`]h`Y`f`Hi`fb]h]b`c`f`U`A`cc`X`Y`
U`gg][`ba`Yb`h`i`h`]b`g`h`U`b`W`g`k`\\Y`f`Y`h`g`]g`b`c`h`d`c`g`g]V`Y`z`]h`k`]`V`Y`g`h`U`h`X`c`b`mci`f`W`ci`fg`Y`g`A`cc`X`Y`g`]h`k`]h`
U`h`Y`fb`U`h]`Y`gi`Va`]gg]cb`X`Y`h]g`"

:`c`f`]b`Z`c`f`a`U`h]c`b`c`b`\\c`k`hc`gi`Va`]h`U`gg][`ba`Yb`h`g`c`b`]b`Y`j`]U`A`cc`X`Y`.\\`h`d`g`#`g`h`X`Y`b`h`i`bgk`"YXi`"Ui`#`c`k`!
gi`Va`]h`U`gg][`ba`Yb`h`a`cc`X`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]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'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'YW'i \]XYg" \]VfUfm'i bgk "YXi "Ui #' \]gY#JVci h' \]gY](#)

