ARTS3220

5g]Ub 7]hYg. Ghi X]Yg]b <]ghcfmž 7i `hifY UbX HfUXY

GYa YghYf CbY ¨#¨&$%

7ci fgY C j Yfj]Yk

GHUZZ 7cbHUWh 8YHU]`g

7cbj Ybcfg

BUa Y	9a U]`	5j U]`UV]`]hm	@cWUh]cb	D\cbY
8f" A Ufb]Y : YbY Ym a "ZYbY Ym4 i bgk "YXi "Ui				Ž * %&- ' ,) &&, -

GW\cc` 7cbHUWh]bZcfa Uh]cb

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

@cWUh]cb. GW\cc` C ZZ]WYž A cfj Yb 6 fck b 6 u ]`X]b[ž @Yj Y` &ž &),

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

D\cbY. Ž * %&- ' ,) %*, %

: Ul . Ž * %&- ' ,) , +$)

9a U]`. \U 4 i bgk "YXi "Ui

5HYbXUbWY F Yei]fYa Ybhg

5 ghi XYbh]g Yl dYWHYX hc UHYbX U ``WUgg WcbHUWh \ci fg Zcf U ZUWY!hc!ZUWY fl &: Ł cf V YbXYX Wci fgY UbX Wca d YHY U ``UWhj]h]Yg Zcf U VYbXYX cf Z `micb]bY Wci fgY"

5 ghi XYbh k\c Uff]j Yg a cfY h\Ub `%) a ]bi hYg `UhY a UmbY XYb]Y`g YX Zcf bcb!UhhYbXUbWY" Ł gu WX U dYbU`hm]g a dcgYXž h\Y ghi XYbh a ughVY]bZcfa YX j YfV ‰ Uhh\Y YbX cZ WUgg UbX UXj]gYX]b k f]h]b[k]h\ ]b &(\ci fg"

Ł U ghi XYbh Yl dYf]YbWY g]$ Yggž a]g UXj Ybh fY cf ch Yf cVWi ffYbWY h\Uha U_Yg UVgYbWY Zfca `U WUgg#UWhj ]h]U i bUj c]XUV Yž cf Yl dYWHYg hc VY UVgYbhž Zca `Ž cfh\ ]b [`WUgg#UWhj ]hmž h\Y mug\ci `X gYY_ dYfa]gg]cb Zca `h\Y 7ci fgY 5i h\cf]Užž UbX k \YfY Udd`WUV Yž h\Y]ffYu Yghg\ci `X VY UWca dUb]YX VU` Ub cf[ ]bU` cf WYfh]Z]YX WcdmcZ a YX]WU` WYfh]Ž UUHY cf ch Yf Zca ``cZUddfcdf]UhY Yj]XYbWY"

5 7ci fgY 5i h\cf]Ua UmYl WWgY U ghi XYbhž Zca ``WUggYg cf`UWj ]h]Yg Zc`i d hc cbY a cbh\" < ck Yj fž h\Ym a UU Ugg][b UXX]h]cbU `UbX#cf`UhYfbUhj Y `Ug_g hc Ybgi fY Wa d ]UbWY" 5 7ci fgY 5i h\cf]Ua Wcbg]XYf]b[ `h\Y [fUbh]b[cZUVgYbWY a ughVY gUh]gZ]YXž h\Uh U ghi XYbh k]$ ght$ VY UV Y hc a YYhh\Y Wci fgY'g `YUfb]b[ `ci hWa Yg UbX#cf]c u a Y `cZ YUfb]b[ " 5 ghi XYghgYY_]b[ `Uddfcj U``hc VY UVgYbh]Zca cfh\Ub `cbYa cbh\a uguhUdd`m ]b k f]h]b[ `hc h\Y 8 YUb UbX dfcj ]XY U``cf][ ]bU `cf WYfh]Ž]YX gi ddcfh]b[ `XcWi a YbhUh]cb"

: cfa cfY]bZca Uh]cb UVci h h\Y UHYbXUbWY `dfchcWc`g]b h\Y : UWu`hm cZ 5fhg UbX GcWU `GWYbWYg. \hhdg.#k k k "Ufhg "i bgk "YXi "Ui #WffYbhghi XYbhg#UWUXYa]W]bZca Uh]cb#dfchcWc`g! [i ]XY `]bYg#

.

5WUXYa]W]bZca Uh]cb

5ggYgga Ybh

5ggYgga Ybh HUg_g

5ggYgga Ybh HUg_	K Y][\h	8i Y 8UhY	Ghi XYbh @YUfb]b[Ci hWca Yg 5ggYggYX
Dcd E i]n	%) ı	&&#$' #&$% %& $$ DA	%
F Ydcfh	%) ı	&* #$(#&$% %$ $$ 5A	%ž&ž(
9ggUm D Ub	&$ı	$' #$) #&$% %$ $$ 5A	%ž&ž
9ggUm	) $ı	%+ #$) #&$% $($$ DA	%ž&ž

5ggYgga Ybh 8YHU]`g

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GHUfh XUhY . B ch 5dd`]WJV Y

@Yb[h\ . () a]b

8YHU]`g . Ghi XYbhg Wca d YHY U a i ]d`Y W\c]WY ei]n cZ ($ ei Ygh]cbg]b WU" $ a]bi HYg Ghi XYbhg fYW]j Y U a Uf_ UbX WcffYWhUbgk Yfg

5ggYgga Ybh & F Ydcfh

GHUfh XUhY . B ch 5dd`]WJV Y

8YHU]`g . Ghi XYbhg k cf_ ]c[ Yh Yf cb U [ fci d fYgYUfW\ dfc YWhUbX dfYgYbh ]hcfU`"m]hc h\Y WUgg]b U dfYgYbhUh]cb cZ %) a]bi HYg Ghi XYbhg k]`` VY a Uf_YX]bX]j]Xi U`'m Ghi XYbhg fYW]j Y U a Uf_žU fu Vf]WUbX Wca m Ybhg

5ggYgga Ybh ' 9ggUm D Ub

GHUfh XUhY . B ch 5dd`]WJV Y

8YHU]`g . Ghi XYbhg k]``XYgW]VY h\Y]fYggUm Uf[ u a Ybhžghfu Wti fY UbX gci fWYg ]b Ub YggUm d Ub cZ )$$ k cfXg H\Ymk ]``fYW]j Y]bX]j]Xi U Wca m Ybhg

5ggYgga Ybh (9ggUm

GHUfh XUhY . B ch 5dd`]WJV Y

8YHU]`g . þX]j]Xi U`fYgYUfW\ YggUm cZ žž$$$ k cfXg H\]g k]``fYW]j Y k f]hhYb ZYYXVUW_ f]]bgtfi Wtcf£ H\]g g h\Y Z]bU UggYgga Ybhžcf UhhYbXUbW `di fdcgYg

Hi fb]h]b gYHh]b[. H\]g Ugg][ba Ybh]g gi Va]hYX h\fci [H\i fb]h]b UbX ghi XYbhg WUb gYY H\i fb]h]b g]a]Uf]m fYdcfhg

Gi Va]gg]cb ˙cŽ˙5ggYgga Ybh˙HUg_g

Ghi XYbhg˙UfY˙Yl dYWhYX˙hc˙di hh\Y]f˙bUa Yg˙UbX˙ghi XYbh˙bi a VYfg˙cb˙Yj YfmdU[Y˙cŽh\Y]f˙Ugg][ba Ybhg"

Hi fb]h]b˙Gi Va]gg]cb

Žmci ˙YbWci bhYf˙U˙dfcV˙Ya ˙k \Yb˙Uh]Ya dh]b[˙hc˙gi Va]h]mci f˙Ugg][ba Ybhh\fci [\˙Hi fb]h]bŽd˙YUgY˙hY˙Yd\cbY˙9l h]YfbU˙Gi ddcfh]cb˙-˙ ' ,) ˙' ' ˙ %˙cf˙Ya U]˙h\Ya ˙cb˙[Yl h]YfbU˙hY˙hgi ddcfh4 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˙mYUfŁ"˙Žmci UfY˙i bUV˙Y˙hc˙gi Va]h]mci f˙Ugg][ba Ybh˙Xi Y˙hc˙U˙ZUi ˙k h]h]b˙Hi fb]h]b˙mci ˙a Um˙Udd˙m˙Zcf˙Ub˙Yl hYbg]cbžVi h]mci a i ghfYHU]b˙mci f˙h]W_Ybh˙i m VYf˙Zca ˙9l h]YfbU˙Gi ddcfh]fU˙cb[˙k]h\˙Ubmci h\Yf˙fY˙Yj Ubh˙XcW˙a YbhgŁ˙hc]bWi XY˙Ug˙Yj]XYbWY˙hc˙gi ddcfh]mci f˙Yl h]Yfbg]cb˙Udd˙]WUh]cb"˙Žmci ˙Ya U]˙9l h]YfbU˙Gi ddcfh]mci ˙k]˙Ui hca Uh]WU˙mfYWW]j Y˙h]W_Yhi a VYfž˙Vi h]Žmci ˙hY˙Yd\cbY˙mci ˙k]˙bYYX˙hc˙gdYWW]WU˙mUg_˙Zcf˙cbY"˙Hi fb]h]b˙U˙gc˙dfcj]XYg˙i dXUhYg˙cb˙h\Y]f˙gmghYa ˙ghUhi g˙cb˙Hk]hhYf"

; ˙YbYfU˙`mžŽUggYgga Ybh˙HUg_g˙a i ghVY˙gi Va ]hhYX˙Y˙YWhfcb]WU˙mj ]U˙Y]h\Yf˙Hi fb]h]b˙cf˙U˙A ccX˙Y Ugg][ ba Ybh˙Ɓ]bghUbWYg˙k \YfY˙h\]g˙]g˙bch˙dcgg]V˙Yž]h]k ]˙VY˙ghUhYX˙cb˙mci f˙Wci fgY'g˙A ccX˙Y˙g]hY˙k ]h\˙U˙hYfbUh]j Y˙gi Va ]gg]cb˙XYhU]`g"

@UhY˙5ggYgga Ybh˙DYbU`h]Yg

5b˙UggYggYX˙HUg_`]g˙XYYa YX˙UhY˙]Ž]h]g˙gi Va]hhYX˙UZhYf˙h\Y˙gdYW]Į]YX˙h]a Y˙UbX˙XUhY˙Ug˙gYhci h]b˙h\Y˙Wci fgY˙@YUfb]b[˙A UbU[Ya Ybh˙GmghYa ˙f@A GŁ"

H\Y˙UhY˙dYbU`hm]g˙h\Y˙cgg˙cŽ)ı ˙cŽh\Y˙hchU˙dcgg]V˙Y˙a Uf_g˙Zcf˙h\Y˙Ug_˙Zcf˙YUW\˙XUmcf˙dUfh]h\YfYcŽh\Y˙k cf_˙]g˙UhY"˙@UhYbYgg˙k]˙]bWi XY˙k YY_YbXg˙UbX˙di V˙]W\c]XUmg"˙H\]g˙XcYg˙bch˙Udd˙mhc˙U˙Hg_˙h\Uh]g˙UggYggYX˙Vi h]bc˙a Uf_]g˙Uk UfXYX"

K cf_˙gi Va]hhYX˙Zci fhYYb˙f%(ŁXUmg˙UŽYf˙h\Y˙Xi Y˙XUhY˙k]˙VY˙a Uf_YX˙UbX˙ZYYXVUW_˙dfcj]XYX˙Vi h]bc˙a Uf_˙k]˙VY˙fYWcfXYX"˙Žh\Y˙k cf_˙ci ˙X˙\Uj Y˙fYWW]j YX˙U˙dUgg˙a Uf_˙Vi h]Zcf˙h\Y˙UhYbYgg˙UbX˙h\Y˙k cf_]g˙U˙Wca di ˙gcfmWci fgY˙Wca dcbYbhžU˙ghi XYbh]k]˙VY˙XYYa YX˙hc˙\Uj Y˙Ah\U˙UhɁfYei]fYa Ybh"˙H\]g˙XcYg˙bch˙Udd˙mhc˙U˙Hg_˙h\Uh]g˙UggYggYX˙Vi h]bc˙a Uf_˙]g˙Uk UfXYX"

K cf_˙gi Va]hhYX˙hk YbhmcbY˙f&%ŁXUmg˙UŽYf˙h\Y˙Xi Y˙XUhY˙k]˙bch]VY˙UWWYdhYX˙Zcf˙a Uf_]b[˙cf˙ZYYXVUW_˙UbX˙k]˙fYWW]j Y˙bc˙a Uf_˙cf[fUXY"˙Žh\Y˙UggYgga Ybh˙HUg_]g˙U˙Wca di ˙gcfmWca dcbYbh]cŽh\Y˙Wci fgY˙U˙ghi XYbh]k]˙Ui hca Uh]WU˙mZU]˙h\Y˙Wci fgY"

GdYWJU`˙7 cbg]XYfUh]cb˙5dd`]WUh]cbg

Mci ˙WUb˙Udd˙m]Zcf˙gdYWJU`˙Wcbg]XYfUh]cb˙k \Yb˙]˙bYgg˙cf˙ch\Yf˙WJfWi a ghUbWYg˙]bhYfŽYfY˙k]h\˙mci f˙UggYgga Ybh˙dYfŽcfa UbWY"

G]W_bYggž˙a]g˙UXj Ybh˙fY˙cf˙ch\Yf˙WJfWi a ghUbWYg˙VYmcbX˙mci f˙Wcbhfc`˙a Um

Ł˙DfYj Ybh]mci ˙Zca ˙Wca d˙Yh]b[˙U˙Wci fgY˙fYei]fYa Ybhž

Ł˙?YYd˙mci ˙Zca ˙UhhYbX]b[˙Ub˙UggYggUV˙Y˙UWh]j]hmž

Ł˙Ghcd˙mci ˙gi Va]h]b[˙UggYggUV˙Y˙k cf_˙cf˙U˙Wci fgYž

5WUXYa]W<cbYghmUbXD`U[]Uf]ga

D`U[]Uf]ga]g`ig]b[`h\Y`kcfXg`cf`]XYUg`cZch\Yfg`UbX`dfYgYbh]b[`h\Ym`Ug`mcif`ckb"`±h\Ub`h\U_Y`a`Ubm`Zcfa`gž`Zfca`XY`]VYfUhY`WXYUh`]b[`hc`UWW]XYbhU``mWcdm]b[`Zfca`U`gcifWY`k`]h\ci`h`UW_bck`]YX[Ya`Ybh"

I BGK`[fcidg`d`U[]Uf]ga`]bhc`h\Y`Zc``ck]b[`WUhY[cf]Yg.

7cdm]b[`.`ig]b[`h\Y`gUaY`cf`jYfmg]a]`Uf`kcfXg`hc`h\Y`cf][]bU``hYl`hcf`]XYU`k]h\ci`h`UW_bck`]YX[]b[`h\Y`gcifWY`cf`ig]b[`eichUh]cb`a`Uf_g"`H\g`U`gc`Udd`]Yg`hc`a`U[Ygž`UfhUbX`XYg[b`dfcYWhgž`Ug`k`Y``Ug`dfYgYbhUh]cbg`k`YfY`cma`YcbY`dfYgYbhg`Ubch\Yf`g]XYUg`cf`kcfXg`]h\ci`h`WfYX]h"

±bUddfcdf]UhY`dUfUd`fUg]b[`.`WXUb]b[`b[`U`ZYk`k`cfXg`UbX`d`hUgYg`k`h`]Y`a`cgh`mfYHU]b]b[`h\Y`cf][]bU``ghfi`Wh`fY`UbX`]b`Zcfa`Uh]cb`k`]h\ci`h`UW_bck`]YX[Ya`Ybh"`H\g`U`gc`Udd`]Yg`]b`dfYgYbhUh]cb`k`YfY`gca`YcbY`dUfUd`fUgYg`UbchYf`g`]XYUg`cf`kcfXg`]h\ci`h`WfYX]h"`±U`gc`Udd`]Yg`hc`d]YW`b[`hc[Yh\Yf`ei`chYg`UbX`dUfUd`fUgYg`]bhc`U`bYk`k`cYžk`]h\ci`hfYZfYbbW`]b`UbX`U`ght`dXYbHg`ck`b`UbU`mg]g`hc`Vf]b[`h\Y`a`UhYf]U``hc[Yh\Yf"

7c``ig]cb.`k`cf_]b[`k`]h`ch\Yfg`Vi`hdUgg]b[`cZZ`h\Y`k`cf_Ug`U`dYfgcb`g`]bX`]Xi`U`k`cf_"`7c``ig]cn`U`gc`]bWi`XYg`dfcj`]X]b[`mcif`k`cf_`hc`Ubch\Yf`ghi`XYbhVYZcfY`h\Y`Xi`Y`XUhYžcf`Zcf`h\Y`di`fdcgY`cZh\Ya`d`U[]Ug]b[`UhUbmh]a`Yž`dU]b[`Ubch\Yf`dYfgcb`hc`dYfZcfa`Ub`UWUXYa]WhUg_žghYU``b[`cf`UWéi]f]b[`Ubch\Yf`dYfgcb`g`UWUXYa]WWk`cf_`UbX`Wcdm]b[`]ž`cZZYf]b[`hc`Wca`d`YhY`Ubch\Yf`dYfgcb`g`k`cf_`cf`gYY_]b[`dUma`Ybh`cf`Wca`d`Yh]b[`UWUXYa]WWk`cf_"

±bUddfcdf]UhY`W]hUh]cb.`7]h]b[`gcifWYg`k`]h\`]bUvvf`UjYbbch\VYYb`fYUXžk`]h\ci`h`UW_bck`]YX[]b[`h\Y`"gYWdcbXUfm`gcifWY`Zfca`k`]h\`_bck`]YX[Y`cZh\Ya``Ug`VYYb`cVhU]bYX"

8id`]WUh]cb`f]gY`Zd`U[]Uf]ga`".`gi`Ym`]h]b[`mcif`ckb`k`cf_ž`b`k`c`Y`cf`]b`dUfhž`k`YfY`]h\Ug`dfYj]cig`m`VYYb`dfYdUfYX`cf`gi`Ym`]hhYX`Zcf`Ubch\Yf`UggYgga`Ybh`cf`Wci`fgY`UhI BGK`cf`Ubch\Yf`i`b]vYfg]hm"

7cffYWh]fYZfYbbW]b[`dfUWh]WWg.

- VYhhYf'a UbU[Y'mci f'h]a Y

7ci fgY GWXYXi `Y

H]a YHUV`Y

8UhY	HmdY	7cbhYbh
K YY_`%`&*`: YVfi Ufm!`(A UfWX	@YWhi fY	=bhfcXi Wh]cb`!`H\]g`YWhi fY`k]``dfcj]XY`Ub`cj Yfj]Yk cZh\Y`Wci fgY`UbX`cc_`Uhh\Y`Zc``ck]b[`ei Ygh]cbg` K \UhXc`k Y`a YUb`Vm`5g]U`UbX`GYUg]U3 K \Uh]g`h\Y`VYbYZ]hcZi bXYfgHUbX]b[`5g]Ub`\]ghcfm3 <ck `WUb`UfWXUYc`c[mYb\UbWY`\]ghcf]WU` i bXYfgHUbX]b[3  <ck `WUb`bYk `hYWbc`c[mY`d`ui g`i bXYfgHUbX`UbX dfYgYfjY`h\Y`dUgh3
K YY_`&`) `A UfWX`!`%% A UfWX	@YWhi fY	K Aidh]g`UbX`bgYghhUbg`!`H\Y`A Uf]a Y`G]`_Fci hY  H\Y`hfUbga]gg]cb`cZfY`][]cbž`Wi`hi fY`UbX`hfUXY" H\]g`YWhi fY`k]``YId`U]b`h\Y`UbW]Ybh`a Uf]a Y`gd]WY fci hY`UbX`]hg`]a dUWh`cb`h\Y`Wj]`]nUh]cbg`cZ`5g]U" K \UhXcYg`UfWXYc`c[mY`i g`UVci hh\Y`cf][]bg`UbX XYgh]bUh]cbg`cZh\Y`gd]WYg`UbX`[ccX

		H\]g¨YWi¨i fY¨k¨]¨`¨X]gWgg¨fYWWbh¨fYgYUfW¨X k¨\]W¨`]bX]W¨UhYg¨U¨`cb[¨]\]ghcfmcZcWWdUh]cb¨cb¨h¨Y ]g¨UbX¨cZG]b[Udcf¨Y¨VYZcfY¨h¨Y¨9b[`g¨WU¨a¨YX]"¨`
	Hi hcf]U`	
	5ggYgga Ybh	9ggUm¨D¨Ub¨!¨dYYf¨fYj]Yk¨Xi¨f]b[¨h¨Y¨i hcf]U`"¨H\Y Z]bU`¨UggYgga Ybh¨k]``¨VY¨[¨j Yb¨Vm¨YWi fYf"¨&\$ı `cUX]b[
K YY_¨`%\$.¨+¨A Um¨!¨% A Um	@YWi fY	Gf]¨@Ub_U¨!¨¨UbX¨cZgYfYbX]d]m H\]g¨`YWi fY¨`cc_g¨Uh¨Gf]¨@Ub_U’g¨]a dcfUbh¨dcg]h¨cb cb¨h¨Y¨A Uf]h]a Y¨G]`_¨Fci hY¨UbX¨\ck¨]hVYWUa Y¨Ub]a dcfUbh¨fUXY¨dcgh¨UbX¨6i XX\]ghWWbhfY¨cZ h¨YUWX]b[¨"¨
	Hi hcf]U`	
K YY_¨`%%¨`%(¨A Um¨!¨&\$ A Um	@YWi fY	J]YhbUa ¨!¨¨h¨Y¨\]XXYb¨ghcfm 9l dcfY¨h¨Y¨a mghYf]ci g¨W]h]Yg¨cZì b[¨8 b[¨UbX A]¨Gcb" H\Y¨A]Gcb¨h¨Ya d¨`Y¨[¨fci d¨UfY¨cbY¨cZJ]YhbUa ’g a U¨cf¨hci f]ghUhfUW]cbg"¨Gc¨k¨\c¨k  YfY¨h¨Y¨dYcd¨`Y¨cZ 7\Ua dUk¨\c¨Vi]`hh¨Ya ¨UbX¨w \Uh]g¨YZhcZh¨Y¨f W¨`hi fY3
	Hi hcf]U`	
	5ggYgga Ybh	:]bU`¨UggYgga Ybh¨9ggUm¨ \$\$\$\$¨k cfXg"¨Hc¨VY \UbXYX]b¨Vm¨(da ¨cb¨h¨Y¨%+h¨A Um¨") ı  ¨`cUX]b[
K YY_¨`%&¨`&%A Um¨!¨&+ A Um	@YWi fY	8][]hU`¨5fWVUYc`c[m H\]g¨`YWi fY¨k ]`¨Yl d¨cfY¨h¨Y¨`UhYghUXjUbWW g ]b¨X][]hU`¨a YX]U¨cf¨h¨Y¨Yb\UbWW a YbhUbX¨X]gd¨`Um cZUfWVUYc`c[mUbX¨Udd`YX¨UbX¨\]ghcf]WU`¨fYgYUfW"¨ Gh¨XYbhg¨k]`¨Yl dYf]YbWW¨U"¨8¨J F¨Ui [a YbhYX fU]`mX]gd`Um "
	Hi hcf]U`	
K YY_¨`% .¨&, ¨A Um¨!¨" >i bY	Hi hcf]U`	

F Ygci fWg

DfYgWf]VYX F Ygci fWg

D`YUgY`gYY`cb`a ccX`Y

F YWca a YbXYX F Ygci fWg

D`YUgY`gYY`cb`a ccX`Y

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

: cfa U`ZYYXVUW_ Zca `ghi XYbhg`k]``VY`Wc`YWhYX`j U m9l dYf]YbWY`Uhh\Y`YbX`cZh\Y`Wci fgY"

=a U[Y 7fYX]h