



MDIA2010

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7ci fgY^{*}Cj Yfj]Yk

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7ci fgY 8YHJ] g

7 fYX]hDc]bhg**

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Gi VYWh5fYU."? WW[S H\]g'Wci fgY'Wb'U`gc'VY'ghi X]YX']b'h\Y'Zc``ck]b['gdYW]U`]gUh]cb.'5 dWSf[hWI = dff[' Y

I bXYfgHJbX]b['k \Uh[Ua Yg fYU`mUfY 'UbX`\ck 'h\YmWJb'UZYWiUbX'WfYUhY'Ui X]YbWfg]g YggYbfJU` _bck `YX[Y 'Zcf'Yj Yfma YX]U'[fUXi UhY"'=b'h\]g 'Wci fgY 'k Y 'ZcW' g 'cb'h\Y'a cgh'Wca a cb'hmdYg 'cZ[Ua Yg 'h\Uh a YX]U'dfcXi Wfg 'WfYUhYžeWdfage YS_ We"'H\YgY'UfY'[Ua Yg 'h\UhUfY'i gYX'Zcf'fYU'!']ZY'di fdcgYg 'ch\Yf'h\Ub di fY 'YbhYffU]ba Ybh': cf'Yl Ua d`Yž'h\Yma][\h\Y'i gYX'Zcf'gcWJU`'W\Ub[Yž'YXi WUh]cbž'hfU]b]b[ž'UXj Yff]g]b[ž cf'hc'\Y'd'dYcd'Y'UW\]Yj Y 'U'dUff]W'`Uf'\YU'h\ cV'YWf] Y"'=b'h\]g 'Wci fgY 'mci 'k]``'ZcW' g 'cb'h\Y 'WcbWfdh' U` XYg][b'UbX'UbU'mg]g 'cZgYf]ci g'[Ua Yg":H\]g 'WcbhYl hk]``g\UdY'Ub']bj Ygh][Uh]cb']bhc'[Ua Y'UYgh\Yf]Wgž

5ggYgga Ybh

 $\label{thm:condition} $$H\YfY'UfY'h\fYY'UgY'gga Ybh'HUg_g'hc'Wca d'Yh'''Mci 'a i gh'Wca d'Yh'''UbX'\UbX']b'U'``h\fYY'HUg_g']b'cfXYf hc'dUgg'h\]g'Wci fgY'''H\]g'a YUbg'h\Uh'mci 'k]``'ZU]`']Zmci 'Xc'bch\UbX']b'cbY'HUg_'Yj Yb']Zmci '\Uj Y'U'hcHU' [fUXY'cZcj Yf') $'Zfca 'h\Y'ch\Yf'k c'Ugg][ba Ybhg''$

GYY'h\Y'WcifgY'kYVg]hY'cb'AccX'Y'Zcf'Z```'Ugg][baYbh'HUg_'XYgWf]dh]cbgžaUf_]b['Wf]hYf]U'UbX'giVa]gg]cb]\$ghfiWf]cbg"

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8YHJ]`g. '* 'g\cfha i `h]d`Y!W\c]WY`cf`g\cfhUbgk Yf`hYl hig]b[`Y!UhhYa dh'UWfj]]h]Yg``]b_YX`hc`* 'k YY_g`cZ`YWfi fY WtbhYbh': YYXVUW_j]U`Wti fgY`@A G"`

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

H\YfY"UfY"Hkc:XXYUXX]b]bbggcZcHr]by]tybfUg_"

GhUfh XUhY.

8YHJ]`g.; fci d`dfc^YWi]b`HYUa g`cZ&!("`Gi Va]HHYX`Wta dcbYbhg`UfY.`,!\%`a]bi HY`dfYgYbhUh]cbž\%\&`a]bi HY [Ua Yd`UmXcW a YbhUh]cbž[Ua Y`dfchchmdY`XcW a YbhcZ, \$\$!\%\$\$\$`k cfXg": YYXVUW_j]U`Wti fgY`@A G"

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

 $H\g^{'}\Ug^{'$

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K_YY_`%\$.`&&`5df]``!`&, 5df]`	@YWn fY	8Yg][b]b['mcif'; Ua Yg'UbX'DfcXi W]b['mcif DfchchmdY'DUW_U[Y 5Xj]WY'UbX'h]dg'Zcf'dfcXi W]b['mcif'[Ua Y'dfchchmdY dUW_U[Y'UbX'dfYgYbhUh]cb"' :]bU''; Ua Y'DfYgYbhUh]cbg'hc'h\Y'7`]Ybh

Fygci fWyg

DfYgWf]VYX F Ygci fWYg

 $5 ```k YY_mfYUX]b[gž'[Ua Ygž'UbX'ch\Yf'Wci fgY'WcbhYbhk]```VY'Uj U]`UV`Y'j]U'h\Y'Wci fgY'k YVg]hY'cb A ccX`Y''$

FYWca a YbXYX FYgci fWYg

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

Gi Va]gg]cb cZ5ggYgga YbhHUg_g

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HY'Yd\cbY'9| hYfbU''Gi ddcfhcb'-',) '' ' ' %cf'Ya U] 'h\Ya 'cb'Y! hYfbU'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'fl *) 'XUmg'U'mYUfŁ" Image:

UfY'i bUV'Y'hc'gi Va]hmci f'Ugg][ba YbhXi Y'hc'U'ZJi 'hk]h\ 'Hi fb]hJb'mci 'a UmUdd'mZcf'Ub'Y! hYbg]cbž'Vi hmci
a i ghfYhJ]b'mci f'hJW_Yhbi a VYf'Zfca '9! hYfbU''Gi ddcfhfU'cb['k]h\ 'Ubmch\Yf'fY'Yj UbhXcW a YbhgŁ'hc
]bWi XY'Ug'Yj]XYbW' 'hc'gi ddcfhmci f'Y! hYbg]cb'Udd']WUh]cb" Image: Ya U]''9! hYfbU''Gi ddcfhmci 'k]''

Ui hca UhJWJ''mfYW'] Y'U'hJW_Yhbi a VYfž'Vi h]Zmci 'hY'Yd\cbY'mci 'k]'''bYYX'hc'gdYWJZWJ''mUg_'Zcf'cbY"

Hi fb]hJb'U'gc'dfcj]XYg'i dXUhYg'cb'h\Y]f'gmghYa 'ghUh' g'cb'Hk]hYf"

; YbYfU``mž'UggYgga YbhiHug_g'a i ghVY'gi Va]hhYX'Y`YVWfcb]\W)``mj]U'Y]h\Yf'Hi fb]hjb'cf'U'A ccX`Y Ugg][ba Ybh'' =b']bgHJb\W'g'k \YfY'h\]g']g'bchdcgg]V`Yž']hk]``'VY'gHJhYX'cb'mci f'\\circ i fgY'g'A ccX`Y'g]hY'k]h\ U`hYfbUhj Y'gi Va]gg]cb'XYHJ]`g''

cfi]bZcfa Uh]cbicbi\ckihcigi Va]hUgg][ba Ybhgicbi]bYij]UiA ccXiY.i\hdg.#gh XYbh'i bgk "YXi "Ui #\ck! qi Va]hUgq][ba Ybha ccXiY

5 WUXYa]W<cbYghmUbX D`U[]Uf]ga

D`U[]Uf]ga `]g`i g]b['h\Y`k cfXg`cf`]XYUg`cZch\Yfg`UbX`dfYgYbh]b['h\Ya `Ug`mci f`ck b"'=hWJb'hU_Y`a Ubm Zcfa gžZfca `XY`]VYfUhY`W\YUh]b['hc`UWW]XYbhU`mWcdm]b['Zfca `U`gci fWY'k]h\ci hUW_bck `YX[Ya Ybh'

IBGK [fcidgdu[]uf]ga]bhch\YZc``ck]b[WuhY[cf]Yg.

7 cdm]b[.'i g]b['h\Y'gUa Y'cf'j Yfmg]a]`Uf'k cfXg'hc'h\Y'cf][]bU`hYl h'cf']XYU'k]h\ci h'UW_bck `YX[]b['h\Y gci fW'cf'i g]b['ei chUh]cb'a Uf_g"'H\]g'U`gc'Udd`]Yg'hc']a U[Ygž'Ufh'UbX'XYg][b'dfcYWgž'Ug'k Y``'Ug dfYgYbhUh]cbg'k \YfY'gca YcbY'dfYgYbhg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci h'WfX]h'

=\uddfcdf]UhY 'dUfUd\fUg]b[.'7\Ub[]b['U'ZYk 'k cfXg'UbX'd\fUgYg'k \]'Y 'a cghmfYhJ]b]b['h\Y'cf][]bU`
ghfi Whi fY 'UbX#cf'dfc[fYgg]cb'cZ]XYUg'cZh\Y'cf][]bU`ž'UbX']bZcfa Uh]cb'k]h\ci h\UW_bck `YX[Ya Ybh''H\]g'U`gc
Udd`]Yg']b'dfYgYbhUh]cbg'k \YfY 'gca YcbY'dUfUd\fUgYg'Ubch\Yf'g']XYUg'cf'k cfXg'k]h\ci h\UhYX]hUbX'hc
d]YW]b['hc[Yh\Yf'ei chYg'UbX'dUfUd\fUgYg']bhc'U'bYk 'k \c`Yž'k]h\ci h\Uddfcdf]UhY'fYZYfYbW]b["

7 c``i g]cb.'k cf_jb['k]h\ch\Yfg'Vi hdUgg]b['cZZh\Y'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'Ubch\Yf'ghi XYbhVYZcfY'h\Y'Xi Y'XUhYžcf'Zcf'h\Y'di fdcgY'cZh\Ya d`U[]Uf]g]b['UhiUbmh]a Yž'dUm]b['Ubch\Yf'dYfgcb'hc'dYfZcfa 'Ub'UWUXYa]WhUg_ž'ghYU']b['cf'UWei]f]b[Ubch\Yf'dYfgcb'g'UWUXYa]Wk cf_'UbX'Wcdm]b[']hz'cZYf]b['hc'Wca d'YhY'Ubch\Yf'dYfgcb'g'k cf_'cf'gYY_]b[dUma YbhZcf'Wca d'Yh]b['UWUXYa]Wk cf_"

±bUddfcdf]UhY`W]hUh]cb.`7]h]b[`gcifWrg`k\]W\`\UjY`bchVYYb`fYUXžk]h\cihUW_bck`YX[]b[`h\Y`´gYWcbXUfm´gcifWrZfca`k\]W\`_bck`YX[Y`cZh\Ya`\Ug`VYYb`cVhU]bYX"

8 i d`]\W\n]cb`ffgY`Z\d`U[]\Uf]ga "Ł`gi Va]\n]b[`mci f`ck b`k cf_z`]b`k \c`Y`cf`]b`dUffz`k \YfY`]h\Ug`dfYj]ci g`m VYYb`dfYdUfYX`cf`gi Va]\nYX`Zcf`Ubch\Yf`UggYgga Ybhcf`\\cf\\text{i fgY`UhI_BGK_`cf`Ubch\Yf`i b]j Yfg]\m'

7 cffYWnfYZYfYbWlb['dfUWnWyg.

- DUfUd\fUg]b[žgi a a Uf]g]b[žYggUmk f]h]b['UbX h]a Y a UbU[Ya Ybh
- 5ddfcdf]UhY'i gY'cZUbX'Uhtf]Vi h]cb'Zcf'U'fUb[Y'cZa UhYf]U`g']bWi X]b['hYl hž']a U[Ygž'Zcfa i `UY'UbX WbWYdhg"

±0X]j]Xi U``Ugg]ghUbWr`]g`Uj U]`UV`Y`cb`fYei YghZfca `H\Y`@YUfb]b[`7 YbhY`f\hd.#k k k "`Wi bgk "YXi "Ui #£" Gh XYbhg`UfY`U`gc`fYa]bXYX`h\UhWUfYZ ``ha Ybu[Ya Ybh]g`Ub`]a dcfhUbhdUfhcZgh XmUbX`cbY`cZh\Y]XYbh]Z]YX`WUi gYg`cZd`U[]Uf]ga `]g`dccf`h]a Y`a UbU[Ya Ybh'`Gh XYbhg`g\ci `X`U``ck `gi Z]W]Ybh'h]a Y`Zcf fYgYUfW\žXfUZh]b[`UbX`dfcdYf`fYZYfYbW]b[`cZgci fWfg`]b`dfYdUf]b[`U``UggYgga Ybh']hYa g"

IBGK @]VfUfmU`gc`\Ugʻh\Y`9@G9`hcc``UjU]`UV`Y`hc`Ugg]ghmci`k]h\`mcif`ghiXmUhIBGK "'9@G9`]gXYg][bYX`hc`]bhfcXiVW`bYk`ghiXYbhg`hc`ghiXm]b[`UhIBGK`Vih]hWUb`U`gc`VY`U`[fYUhfYZfYg\Yf`Xif]b[`mcifqhiXm"

7 ca d'Yhlb['h\Y'9@&9'hi hcf]U`'UbX'ei]n'k]`'YbUV'Y'mci 'hc.

 UbU`mgY`hcd]\Mgž'd`Ub`fYgdcbgYg`UbX`cf[Ub]gY`fYgYUf\W\`Zcf'U\WXYa]\Wk f]hjb[`UbX`ch\Yf UggYgga YbhhUg_g • i bXYfgHJbX'mci f'f][\hg'UbX'fYgdcbg]V]`]h]Yg'Ug'U'gh XYbh'Uhil BGK

5 WUXYa]W = b Zcfa Uh cb ·

: cf`YggYbhJU``gh XYbh`]bZcfa UhJcb`fY`UhJb['hc.

- fYei Yghg Zcf Yl hYbg]cb/
- `UhY`gi Va]gg]cbg`[i]XY`]bYg/
- fYj]Yk 'cZa Uf_g/
- I BGK '<YU`h\ 'UbX'GUZYhm'dc`]W[Yg/
- YI Ua]bUh]cb dfcWYXi fYg/
- gdYV]JU``Wcbg]XYfUh]cb']b^{*}h\Y'Yj YbhcZ]``bYgg'cf'a]gUXj Ybh fY/
- ghXYbhYei]lmUbXX]gUV]`]lm/
- UbX'ch\Yf'YggYbhJU`'UWUXYa JWJbZcfa UhJcbž'gYY