

## Chapter 3

### Hiding under the covers, listening for the monsters

(sound)

Here are the references and web links for the stories in the book.

**Recently added references are highlighted.** For updates to those stories and for all the new stories, go to

<http://www.flyingcircusofphysics.com/News/NewsDetail.aspx?NewsID=39>

July 2009

#### 3.1 Howling of the wind

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

[http://www.youtube.com/watch?v=i\\_MQ61vyaSM](http://www.youtube.com/watch?v=i_MQ61vyaSM) Vortex shedding by a cylinder

<http://www.youtube.com/watch?v=CB2aWiesq0g> Same here

<http://www.youtube.com/watch?v=SuZRi0q9MAg> another one

#### References

Dots • through ••• indicate level of difficulty

Journal reference style: author, journal, volume, pages (date)

Book reference style: author, title, publisher, date, pages

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#### 3.2 Singing of telephone wires and pine needles

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

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[http://www.youtube.com/watch?v=i\\_MQ61vyaSM](http://www.youtube.com/watch?v=i_MQ61vyaSM) Vortex shedding by a cylinder

<http://www.youtube.com/watch?v=CB2aWiesq0g> Same here  
<http://www.youtube.com/watch?v=SuZRi0q9MAg> another one

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### 3.3 Whistles and whistling

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

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<http://www.germes-online.com/direct/dbimage/50213070/Whistles.jpg>

Photo

<http://www.global-b2b->

[network.com/direct/dbimage/50069429/Safety\\_Whistles.jpg](http://www.global-b2b-network.com/direct/dbimage/50069429/Safety_Whistles.jpg) Photo

<http://www.brandens.net/files/Sounds/FX/Househld/sndfx.htm> Audio

“TEA\_POT.WAV”

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### 3.4 Speaking and singing

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<http://www.youtube.com/watch?v=6Es5nQdTbiA> Woman breaks drinking glass by singing

<http://www.youtube.com/watch?v=IZD8ffPwXRo&mode=related&search=> Man breaks drinking glass

<http://www.youtube.com/watch?v=eTWDEsGIPO8&mode=related&search=> Woman breaks drinking glass by singing. Note that she taps it with her finger to hear the resonance frequency.

[http://www.youtube.com/watch?v=17tqXgvCN0E&mode=related&search=Cool slow motion video of oscillating wine glass.](http://www.youtube.com/watch?v=17tqXgvCN0E&mode=related&search=Cool+slow+motion+video+of+oscillating+wine+glass)

<http://www.youtube.com/watch?v=9hC6sbyqexw> Video talking mynah bird

[http://www.youtube.com/watch?v=anyBbiljocA&mode=related&search=Video talking mynah bird](http://www.youtube.com/watch?v=anyBbiljocA&mode=related&search=Video+talking+mynah+bird)

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### 3.5 Speaking with helium

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

[http://www.youtube.com/watch?v=xtIiPSGm\\_Rw](http://www.youtube.com/watch?v=xtIiPSGm_Rw) Video, but keep in mind that this is an extremely dangerous thing to do.

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### 3.6 Throat singing

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

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Video

<http://www.youtube.com/watch?v=NOsGvs1FZDs> Throat singing done in parts

<http://www.youtube.com/watch?v=AgzL00ky7Gw&mode=related&search=> Throat singing, with one instrument

<http://www.youtube.com/watch?v=8Y81D3QZVUE&NR=1> Throat singing in a concert

<http://www.youtube.com/watch?v=Fg2BtqOsW9A> Throat singing, along with instruments  
<http://www.youtube.com/watch?v=lz6NQuDKALk&mode=related&search=> More throat singing

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## 3.7 Snoring

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<http://www.youtube.com/watch?v=YkiCIim5Fr0> Video of baby snoring  
<http://www.brandens.net/files/Sounds/FX/Househld/sndfx.htm> Scroll down the audio files “LOW\_SNOR.WAV” AND “SNORING.WAV”

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## 3.8 Purring and roaring

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### Video

<http://www.youtube.com/watch?v=vwosfHRTloE> Cat purring  
<http://www.youtube.com/watch?v=aUfDxReIPhg&mode=related&search=>  
 Lion roaring  
<http://www.youtube.com/watch?v=EoXqF7SSJtg> Tiger roaring

### Audio

<http://www.brandens.net/files/Sounds/FX/Animals/sndfx.htm> Scroll to or use a find function to get “lion roar”

<http://www.lairweb.org.nz/tiger/communication.html> Explanation but the sounds file link at the bottom will take you to the sound files.

<http://www.ilovewavs.com/Effects/Animals/Animals.htm> purr and roar

<http://www.ilovewavs.com/index.htm> Read the note about the format. Purr and roar are available under “Animals”.

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### 3.9 Short Story: Sound from a *Parasaurolophus* dinosaur

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<http://www.youtube.com/watch?v=8TrvKg1Xb2k>

<http://www.youtube.com/watch?v=1tWP6aYwi5M&mode=related&search=http://library.thinkquest.org/C0128701/Pictures/lambeosaurus.jpg>

Lambeosaurus

<http://www.news.utoronto.ca/bin6/060124-2008.asp>

[http://members.tripod.com/rc-](http://members.tripod.com/rc-anodizing/PEZT/animalsDD/lambeosaurus.htm)

[anodizing/PEZT/animalsDD/lambeosaurus.htm](http://members.tripod.com/rc-anodizing/PEZT/animalsDD/lambeosaurus.htm) Where to buy a moving replica (with sound)

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### 3.10 Sounds of tigers and elephants

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### Audio

<http://www.brandens.net/files/Sounds/FX/Animals/sndfx.htm>

Scroll to or use a find function to get “elephant trumpeting” and “African elephant roaring”

### References

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### 3.11 Bullfrog croaking

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<http://www.brandens.net/files/Sounds/FX/Animals/sndfx.htm> Scroll to or use a find function to get “frog croaking”

#### References

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### 3.12 Crickets and spiny lobsters

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=DbOmoCR8nhg&NR=1> Video in which we can hear lots of cicadas

<http://www.brandens.net/files/Sounds/FX/Animals/sndfx.htm> Scroll to or use a find function to get “cricket chirping” (several choices)

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### 3.13 Frog playing a tree; cricket playing a burrow

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

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### 3.14 Attack of the Australian cicadas

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### 3.15 Penguin voices

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<http://www.youtube.com/watch?v=6AiCIZ9wM1o> Video

[http://www.youtube.com/watch?v=B71T\\_GpA2AM&feature=related](http://www.youtube.com/watch?v=B71T_GpA2AM&feature=related) voice recognition of parent and chick, David Attenborough video

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### 3.18 Long-distance sound

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### 3.19 Acoustic shadows

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### 3.20 Hearing the Soviet subs

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### 3.21 Cheerleader’s horn, foghorns

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<http://www.sbbfc.co.uk/img/megaphone.jpg> Photo of cheerleader's megaphone

<http://sol.sci.uop.edu/~jfalward/soundinterference/waterdiffraction.jpg>  
Diffraction of water waves through small opening

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### 3.22 Direction of a whisper

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### 3.23 Doppler shift

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=iN3fO5l4Rww&NR=1> Animated explanation

<http://www.youtube.com/watch?v=imoxDcn2Sgo&NR=1> Fire truck siren. The frequency range changes (and the intensity, or loudness, does also)

<http://www.brandens.net/files/Sounds/FX/Transpor/sndfx.htm> Audio racecar. Scroll down to RACE\_CAR.WAV Change in intensity and also change in frequency

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### 3.24 Bat finding an insect

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[www.geocities.com/radar\\_foxbat/](http://www.geocities.com/radar_foxbat/) Photo

<http://www.hcc.hawaii.edu/~pine/images/Bat.jpg> Photo of bat homing in on insect

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### 3.25 Bat finding a flower

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<http://rnsupply.com/ultra015a.gif> Photo stethoscope

<http://rnsupply.com/ultra015a.gif> Photo monaural stethoscope

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### 3.33 Tightening guitar strings and rubber bands

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=p0R6xWhwth4> Video: song with a rubber band

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<http://www.youtube.com/watch?v=BG-aoRWjLdE> Video: Jimmy Page bowing a guitar in concert

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=T1d-ZAoamIY&mode=related&search=> Video: “Porcelian” played on a conch shell. The Red Hot Chili Peppers should be proud.

<http://www.cnn.com/SPECIALS/2001/dalai.lama/gallery/religion.05.html>

Photo

<http://i52.photobucket.com/albums/g34/galadrielights/conch.jpg> Photo of player

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<http://www.phys.unsw.edu.au/jw/didjeridu.html> The didgeridoo page of the University of New South Wales

<http://www.youtube.com/watch?v=9g592I-p-dc&mode=related&search=>

Video

<http://www.youtube.com/watch?v=8NfZLiSMmDk&mode=related&search=>

Video

[http://www.ozoutback.com.au/postcards/postcards\\_forms/abor\\_dance\\_2/Source/4.htm](http://www.ozoutback.com.au/postcards/postcards_forms/abor_dance_2/Source/4.htm) Photo of a player

<http://www.designboom.com/contemporary/didjeridu.html> Photo of various didjeridus and discussion

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### 3.38 Silo quaking and honking

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### 3.39 Singing corrugated tubes

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=JCVaOzlOUfY> Video showing the change in frequency

[http://www.straightdope.com/classics/a2\\_101b.html](http://www.straightdope.com/classics/a2_101b.html) Cecil Adams in his “Straight Dope” column

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### 3.41 Bottle resonance

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<http://www.brandens.net/files/Sounds/FX/Transpor/sndfx.htm> Audio. Scroll down to SKIDDING.WAVE Tire squeal due to stick and slip during acceleration. SKID\_TO.WAV Tire squeal during stopping.

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

[http://www.metacafe.com/watch/934217/party\\_trick\\_amazing/](http://www.metacafe.com/watch/934217/party_trick_amazing/)

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<http://www.youtube.com/watch?v=17tqXgvCN0E&mode=related&search=Videos>

<http://www.youtube.com/watch?v=Pq-PxdOarjA> Breaking a wine glass with the sound from a trumpet. First the explanation and then the actual footage of the breaking.

[http://www.metacafe.com/watch/873394/the\\_singing\\_glass/](http://www.metacafe.com/watch/873394/the_singing_glass/)

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<http://www.youtube.com/watch?v=17tqXgvCN0E&mode=related&search=Videos>

Cool slow motion video of oscillating wine glass.

[http://www.youtube.com/watch?v=ECNDpCYvaOc&mode=related&search= Video, rubbing and breaking a wine glass](http://www.youtube.com/watch?v=ECNDpCYvaOc&mode=related&search=Video%2C+rubbing+and+breaking+a+wine+glass)  
[http://www.youtube.com/watch?v=ABJzzYSw3fs&mode=related&search= Playing wine glass](http://www.youtube.com/watch?v=ABJzzYSw3fs&mode=related&search=Playing+wine+glass)  
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[http://www.youtube.com/watch?v=8\\_OqB7z6xuc](http://www.youtube.com/watch?v=8_OqB7z6xuc) Rubbing a teacup  
[http://www.metacafe.com/watch/183691/glass\\_tunes/](http://www.metacafe.com/watch/183691/glass_tunes/) Street musician

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### 3.44 Shattering wineglasses with voice

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#### Videos

<http://www.youtube.com/watch?v=ofESdVdX-fY> Man breaks glass

<http://www.youtube.com/watch?v=6Es5nQdTbiA> Woman breaks drinking glass by singing. Well, maybe. How many clues do you see that something is wrong?

[http://www.youtube.com/watch?v=IZD8ffPwXRo&mode=related&search=Man breaks drinking glass](http://www.youtube.com/watch?v=IZD8ffPwXRo&mode=related&search=Man%20breaks%20drinking%20glass)

[http://www.metacafe.com/watch/39999/high\\_pitch/](http://www.metacafe.com/watch/39999/high_pitch/) Same video, same troubles

[http://www.youtube.com/watch?v=eTWDEsGIPO8&mode=related&search=Woman breaks drinking glass by singing](http://www.youtube.com/watch?v=eTWDEsGIPO8&mode=related&search=Woman%20breaks%20drinking%20glass%20by%20singing). Note that she taps it with her finger to hear the resonance frequency.

[http://www.youtube.com/watch?v=AnDudcbn3F0&mode=related&search=Man breaks drinking glass](http://www.youtube.com/watch?v=AnDudcbn3F0&mode=related&search=Man+breaks+drinking+glass)

[http://www.youtube.com/watch?v=17tqXgvCN0E&mode=related&search=Cool slow motion video of oscillating wine glass.](http://www.youtube.com/watch?v=17tqXgvCN0E&mode=related&search=Cool+slow+motion+video+of+oscillating+wine+glass)

[http://www.youtube.com/watch?v=ECNDpCYvaOc&mode=related&search= Video, rubbing and breaking a wine glass](http://www.youtube.com/watch?v=ECNDpCYvaOc&mode=related&search=Video,+rubbing+and+breaking+a+wine+glass)

[http://www.youtube.com/watch?v=ABJzzYSw3fs&mode=related&search=Playing wine glass](http://www.youtube.com/watch?v=ABJzzYSw3fs&mode=related&search=Playing+wine+glass)

[http://www.youtube.com/watch?v=UcZmlmdzMjw&mode=related&search=Duo playing wine glasses](http://www.youtube.com/watch?v=UcZmlmdzMjw&mode=related&search=Duo+playing+wine+glasses)

[http://www.youtube.com/watch?v=27POI9uH94M&mode=related&search=Playing wine glasses](http://www.youtube.com/watch?v=27POI9uH94M&mode=related&search=Playing+wine+glasses)

<http://www.youtube.com/watch?v=SQUFkHcyzpc&NR=1> Street musician and wine glasses

[http://www.metacafe.com/watch/396834/breaking\\_wine\\_glass\\_with\\_sound/](http://www.metacafe.com/watch/396834/breaking_wine_glass_with_sound/) Loud speaker breaking a glass with resonance

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### 3.45 Murmuring brooks and rain noise

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

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### 3.46 Jar and beaker resonance

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### 3.47 Rumbling from plumbing

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=h62J1W-fk3w> Video

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### 3.50 Attack of the killer shrimp

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

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### 3.52 Food crushing sounds

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### 3.53 Snap, crackle, and pop

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To see me on television, go to

<http://www.gumfrog.com/dailyplanet> and use Username: previewguest

Password: d1sc0very (note the two numbers)

I suggest that you click the box that allows the computer to remember this information (or you may have to enter it several times)

Choose Jan 2008. Scroll down to Jan 30 / 08. Click on "Fact of the Matter - Cereal"

[http://www.youtube.com/watch?v=dYyl\\_Ns10-8](http://www.youtube.com/watch?v=dYyl_Ns10-8) Video. Listen to the snap, crackle, and pop of the cereal

<http://www.youtube.com/watch?v=5q6xf3pplrw> Video

<http://www.youtube.com/watch?v=q6TIsxTdrCU> Cartoon commercial from the 1950s for Rice Krispies cereal. I watched this and my life was changed. Sound from a cereal!

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### 3.54 Sonic booms from aircraft and bullets

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## Videos

<http://www.youtube.com/watch?v=LKQ-xj5C2m8> The car Thrust SSC breaks the sound barrier and sets the land speed record. Montage of images of the car, its preparation, and the actual runs, including audio. You can hear the car's sonic boom!

<http://www.youtube.com/watch?v=gaGO-we-Fag&mode=related&search=> Soon after the supersonic car passes the camera, we hear the shock wave.

<http://www.youtube.com/watch?v=wcmmLvAYqkI> Huge explosions. Watch the shock wave move across the ground at about 4:25 min and also near the end of the video.

<http://www.youtube.com/watch?v=HJVOUgCm5Jk> Another video of those explosions. Watch the shock wave on the ground; watch the camera shake.

<http://www.youtube.com/watch?v=tmOvKWnMI9Y> Video with sound, passing supersonic airplane

<http://www.youtube.com/watch?v=L7At5Jfc3LM> Video of airplane shedding shockwave cone that is marked by condensation.

<http://www.youtube.com/watch?v=uQ2pkmISOLM> Video, watch for the shock wave cone

<http://www.youtube.com/watch?v=qyDrNX968mw>

<http://www.youtube.com/watch?v=OEmiTYtW5cs>

## Audio

<http://www.brandens.net/files/Sounds/FX/Househld/sndfx.htm>

Scroll down to "GUNSHOTS.WAV"

## Photo

[http://prs-sun-107-nyeh-peshr-hme0-39.digisle.net/science/science\\_news/articles/images/revealing\\_covert\\_actions\\_02.jpg](http://prs-sun-107-nyeh-peshr-hme0-39.digisle.net/science/science_news/articles/images/revealing_covert_actions_02.jpg) Photo of shock wave of a rifle shot

[http://www.eng.vt.edu/fluids/msc/gallery/ss\\_cars/sscar\\_1.htm](http://www.eng.vt.edu/fluids/msc/gallery/ss_cars/sscar_1.htm) Photo, shock wave left by Thrust SSC

[http://www.csun.edu/~adg45981/F18\\_ShockWave.jpg](http://www.csun.edu/~adg45981/F18_ShockWave.jpg) Condensation reveals the shock waves shed by aircraft

<http://groups.msn.com/spacecowboysaloon/douglasd5581.mswn> Web site about the first jet airplane to break the sound barrier.

Shock-wave condensation produced by aircraft that are either supersonic (faster than sound) or almost supersonic. **At least 2 of these are fakes.** Can you spot them?

[http://www.csun.edu/~adg45981/F18\\_ShockWave.jpg](http://www.csun.edu/~adg45981/F18_ShockWave.jpg) Condensation reveals the shock waves shed by aircraft  
<http://www.grunt.com/images-bs/Cobra%20sound%20barrier.jpg>  
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<http://hyperphysics.phy-astr.gsu.edu/hbase/sound/soupic/soubar2.jpg>  
[http://www.gaulard.com/blog/wp-content/uploads/2006/09/sound\\_barrier\\_6.jpg](http://www.gaulard.com/blog/wp-content/uploads/2006/09/sound_barrier_6.jpg)  
<http://hyperphysics.phy-astr.gsu.edu/hbase/sound/soubar.html> Photos plus discussion

Tipping over a V-1 rocket attacking England:

<http://www.fiddlersgreen.net/AC/aircraft/V1/info/info.php> Describes how British pilots would tip over the incoming V-1 (buzz bomb) rockets to make them crash. Plus actual photos of a rocket being tipped over.  
<http://www.theanswerbank.co.uk/article929.html> Description of the V-1 rockets and the tipping.  
[http://www.youtube.com/watch?v=Dtkfz\\_mKGSg](http://www.youtube.com/watch?v=Dtkfz_mKGSg) Videos: Documentary of the rockets (doodlebugs). Part 1  
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[http://www.youtube.com/watch?v=5rbmVqI\\_2Q](http://www.youtube.com/watch?v=5rbmVqI_2Q) Video of a simulation of the tipping. Of course, this is just made up and it shows the airplane wing actually touching the rocket's wing. Such contact would have ripped the airplane wing, which is not a good thing when you need to the wing to stay up in the air.

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### 3.55 Sonic booms from train tunnels

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=nHSyLapG4ZE> Watch the camera shock right before the third train leaves the tunnel. I think the shake is due to a shock wave.

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### 3.57 Brontides---mysterious booms from the sky

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

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### 3.58 Rockfall and tree downing

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://pubs.usgs.gov/of/1999/ofr-99-0385/> Discussion and photos of shock wave due to the rock fall at Happy Isles in 1996.

<http://pubs.usgs.gov/of/1998/ofr-98-0467/> Paper on Rock-fall hazards in Yosemite Valley by G. F. Wiczorek, M. M. Morrissey, G. Iovine, and J. Godt

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=sVmsNDfZeKg&NR=1> Video: whip cracking

[http://www.youtube.com/watch?v=vyf3\\_ipygHA](http://www.youtube.com/watch?v=vyf3_ipygHA)

<http://www.youtube.com/watch?v=-M-6EVXKITg>

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### 3.60 Coughing and sneezing

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=FzRH3iTQPrk> Panda sneezing. If you have a friend who breaks the sound barrier with a sneeze, send this web address.

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### 3.61 Acoustics of rooms and concert halls

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=dEn8MT7gX38> Video, distinct echoes

<http://www.youtube.com/watch?v=bvJGRpaqaV0> More video

[http://www.youtube.com/watch?v=In7NVdKGR\\_o](http://www.youtube.com/watch?v=In7NVdKGR_o) Video; listen closely to the echoes.

<http://www.youtube.com/watch?v=4TQ7AKluAmo> Video, but the echo is not the sound of an eagle as she says

<http://www.ocasa.org/MayanPyramid.htm> D. Lubman, sound bites of echoes at the Mayan pyramid at Chichen Itza in Mexico

[http://physicsweb.org/articles/world/18/12/3/1/PWide4\\_12-05](http://physicsweb.org/articles/world/18/12/3/1/PWide4_12-05) One of the sculptures by Eusebio Sempere

<http://www.acoustics.org/press/136th/meseg2.htm> Another sculpture

<http://www.sciam.com/article.cfm?articleID=00000454-7BF8-1CE2-95FB809EC588EF21> Scientific American article about the sonic sculptures of Sempere

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<http://www.geocities.com/capecanaveral/9461/>

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<http://www.lps.ens.fr/~douady/> This web page for Stephane Douady offers sound bites of the sand sounds but I cannot get the sounds to play. You can give it a try.

Videos of squeaking beach sand

<http://www.youtube.com/watch?v=xP-ZXhtmnaK>

[http://www.youtube.com/watch?v=abHi\\_G-QGgc&mode=related&search=](http://www.youtube.com/watch?v=abHi_G-QGgc&mode=related&search=)

[http://naturalhistorymag.com/master.html?http://naturalhistorymag.com/editors\\_pick/1947\\_09\\_pick.html](http://naturalhistorymag.com/master.html?http://naturalhistorymag.com/editors_pick/1947_09_pick.html) Article in *Natural History* in about singing sands

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### 3.70 Cracking ice and bergy seltzer

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

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### 3.71 Audibility through snow

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The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

<http://www.youtube.com/watch?v=fRrxunfr8Aw> Video: listen to the sounds of walking in snow; well, one type of snow

<http://www.youtube.com/watch?v=Sqy3hQaXcMM> Here are the snows with another type of snow

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### 3.73 “Can you hear the shape of a drum?”

This item is discussed in the book *The Flying Circus of Physics, second edition*, by Jearl Walker, published by John Wiley & Sons, June 2006, ISBN 0-471-76273-3.

The material here is located at [www.flyingcircusofphysics.com](http://www.flyingcircusofphysics.com) and will be updated periodically.

#### Videos

[http://www.youtube.com/watch?v=6sonpvUxGL8&mode=related&search=Chladni patterns on large vibrating plate](http://www.youtube.com/watch?v=6sonpvUxGL8&mode=related&search=Chladni+patterns+on+large+vibrating+plate)

<http://www.youtube.com/watch?v=ZiXNXbGLTR0> Chladni pattern on top plate of violin

<http://www.youtube.com/watch?v=nuS4HmaRxrs> Chladni pattern reveals the oscillations on a plate at various frequencies

[http://www.youtube.com/watch?v=EprMFajNzfQ&mode=related&search=Chladni patterns on plate that is bowed](http://www.youtube.com/watch?v=EprMFajNzfQ&mode=related&search=Chladni+patterns+on+plate+that+is+bowed)

[http://www.youtube.com/watch?v=WLk\\_f2iPrsA&mode=related&search=Chladni patterns on a drum oscillated at different rates](http://www.youtube.com/watch?v=WLk_f2iPrsA&mode=related&search=Chladni+patterns+on+a+drum+oscillated+at+different+rates)

[http://www.youtube.com/watch?v=nuS4HmaRxrs&mode=related&search=Chladni patterns](http://www.youtube.com/watch?v=nuS4HmaRxrs&mode=related&search=Chladni+patterns)

<http://www.youtube.com/watch?v=vIpnkqEDaUA> Subwoofers in a car

[http://www.youtube.com/watch?v=sY6z2hLgYuY&mode=related&search=Chladni patterns part 1](http://www.youtube.com/watch?v=sY6z2hLgYuY&mode=related&search=Chladni+patterns+part+1)

[http://www.youtube.com/watch?v=kWadDtIFPNs&mode=related&search=Chladni patterns part 2](http://www.youtube.com/watch?v=kWadDtIFPNs&mode=related&search=Chladni+patterns+part+2)

[http://www.youtube.com/watch?v=3csi-2Hrzhg&mode=related&search=Chladni patterns part 3](http://www.youtube.com/watch?v=3csi-2Hrzhg&mode=related&search=Chladni+patterns+part+3)

[http://www.youtube.com/watch?v=\\_bAmjRK9wBA&NR=1](http://www.youtube.com/watch?v=_bAmjRK9wBA&NR=1) Chladni patterns part 4

<http://www.youtube.com/watch?v=cXwpPdu9M-U> Vibrating powder shows internal flow

<http://www.youtube.com/watch?v=tcJ732tFab8> Migrating powder

<http://www.youtube.com/watch?v=G3s3wmr5Eb4> Vibrating cinnamon powder

<http://www.youtube.com/watch?v=qvNyD04nzWc> Large oscillations of powder

<http://www.youtube.com/watch?v=WmxAQJIVPZA> More migration of vibrated powder

<http://www.youtube.com/watch?v=7UNtdhxStN0> Rotating thin cylinder of powder

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### 3.74 Infrasound

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