



THE AUSTRALIAN NATIONAL UNIVERSITY

Lessons on Commercialising Your Research

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Commercialising Your Research

- Identifying what can be commercialised
- Steps to achieve commercialisation
- Restrictions on research
- Finding a partner
- Types of partners, advantages
- Benefits
- But first Ted's story...



Ted's story

- 1989 – 1997 **FDT Perimeter**, developed with **Welch Allyn**, a large USA medical instrument company. FDT now sold by Carl Zeiss Meditec
- 2006 to present - developing the **Truefield** objective perimeter with **Seeing Machines**, a small Australian engineering company



Ted's story

- Welch Allyn - a large company model
- Seeing Machines - a small company model





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a short history of the
**Frequency Doubling
Technology (FDT)**
perimeter

spatial frequency doubling (FD) stimuli for glaucoma

- RSBS patented FD method, 1989, 1995
- FDT perimeter 1997
- Made by Welch Allyn, marketed by Carl Zeiss Meditec
- Matrix 2004
- Royalty income to ANU



FDT



Matrix

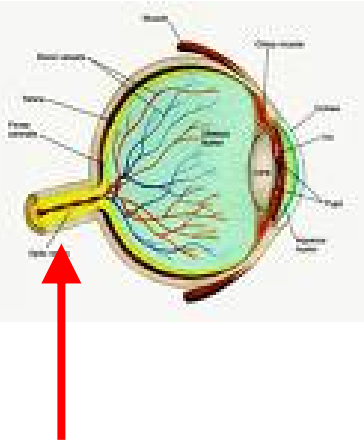
A perimeter what is it?



- tests the sensitivity of different parts of your **visual field**
- each part of the visual field **map** is compared with normal performance
- used for diseases like **glaucoma**

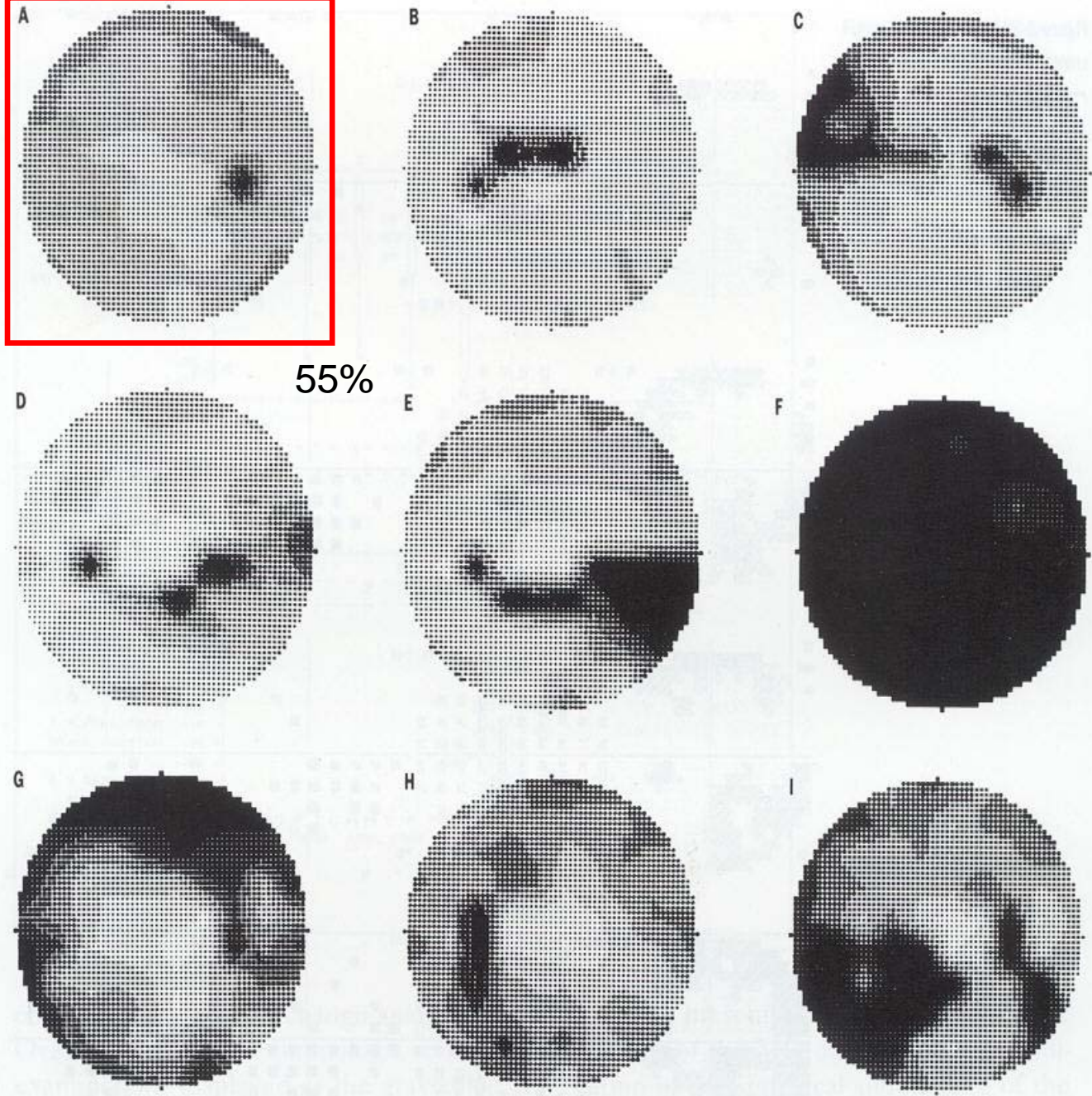


Glaucoma what is it?



- ◆ Glaucoma kills **optic nerve** fibers, disconnecting the eye and brain
- ◆ **Patchy** to complete **blindness** in 2% of people over 50 years
- ◆ by 2010 - 61 million people
- ◆ Possibly related to **poor tolerance** of internal **eye pressure**
- ◆ 50% of glaucoma patients have normal eye pressure





Visual field loss

A diffuse

BD arcuate scotoma

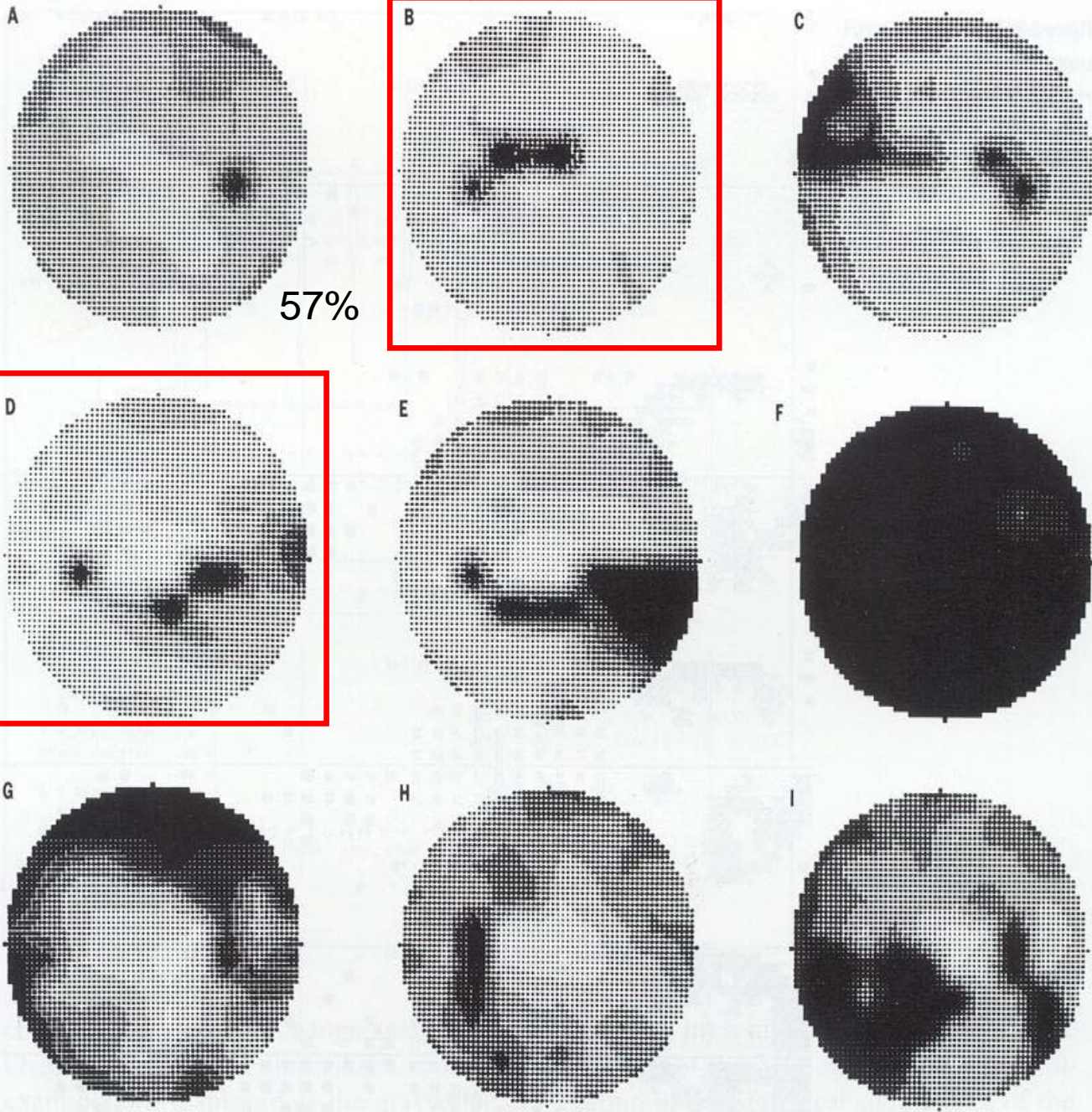
CE nasal step

G peripheral

H blind spot extension

I sectoral

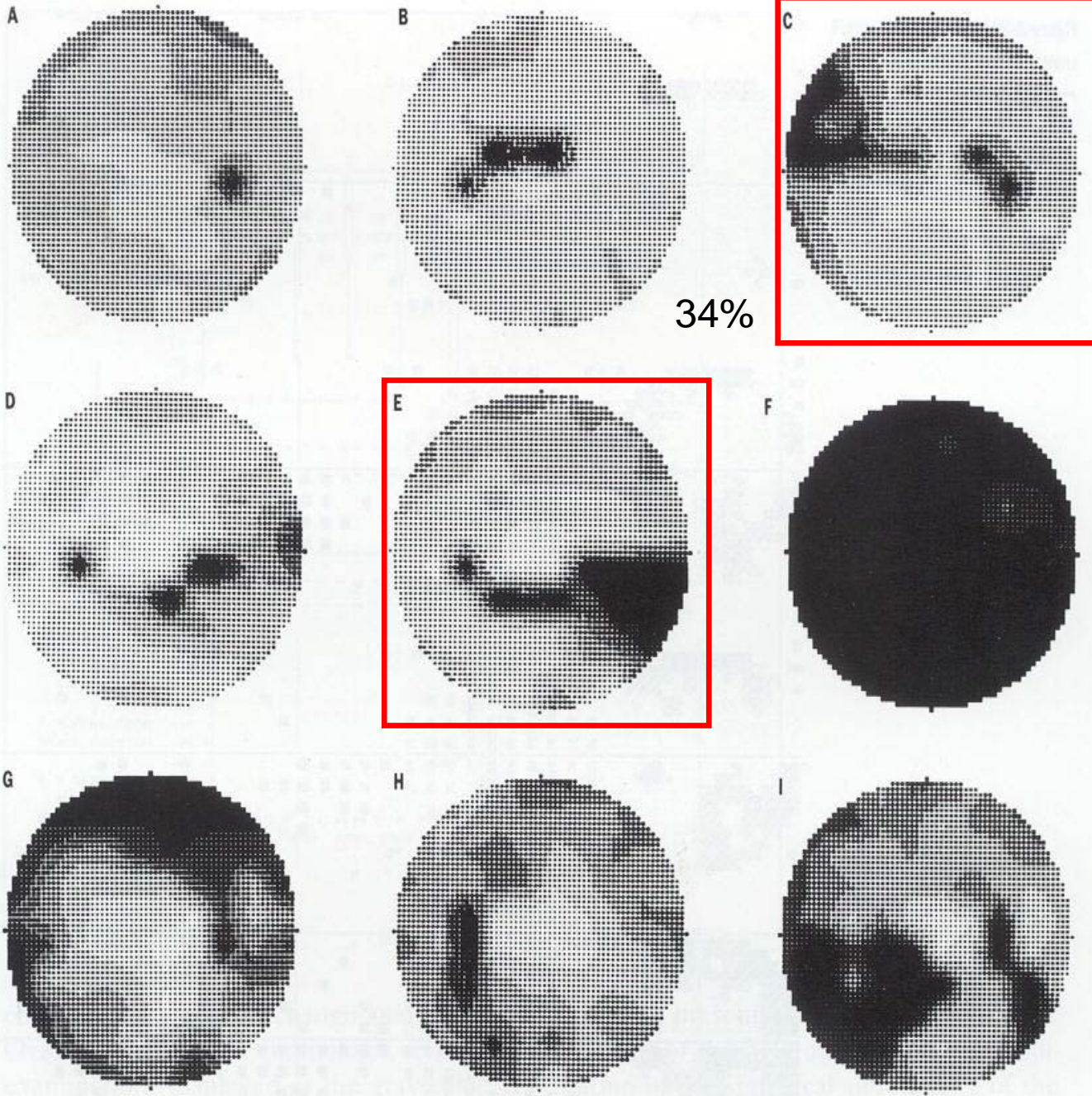
Figure 2.20. Examples of patterns of visual field loss.



57%

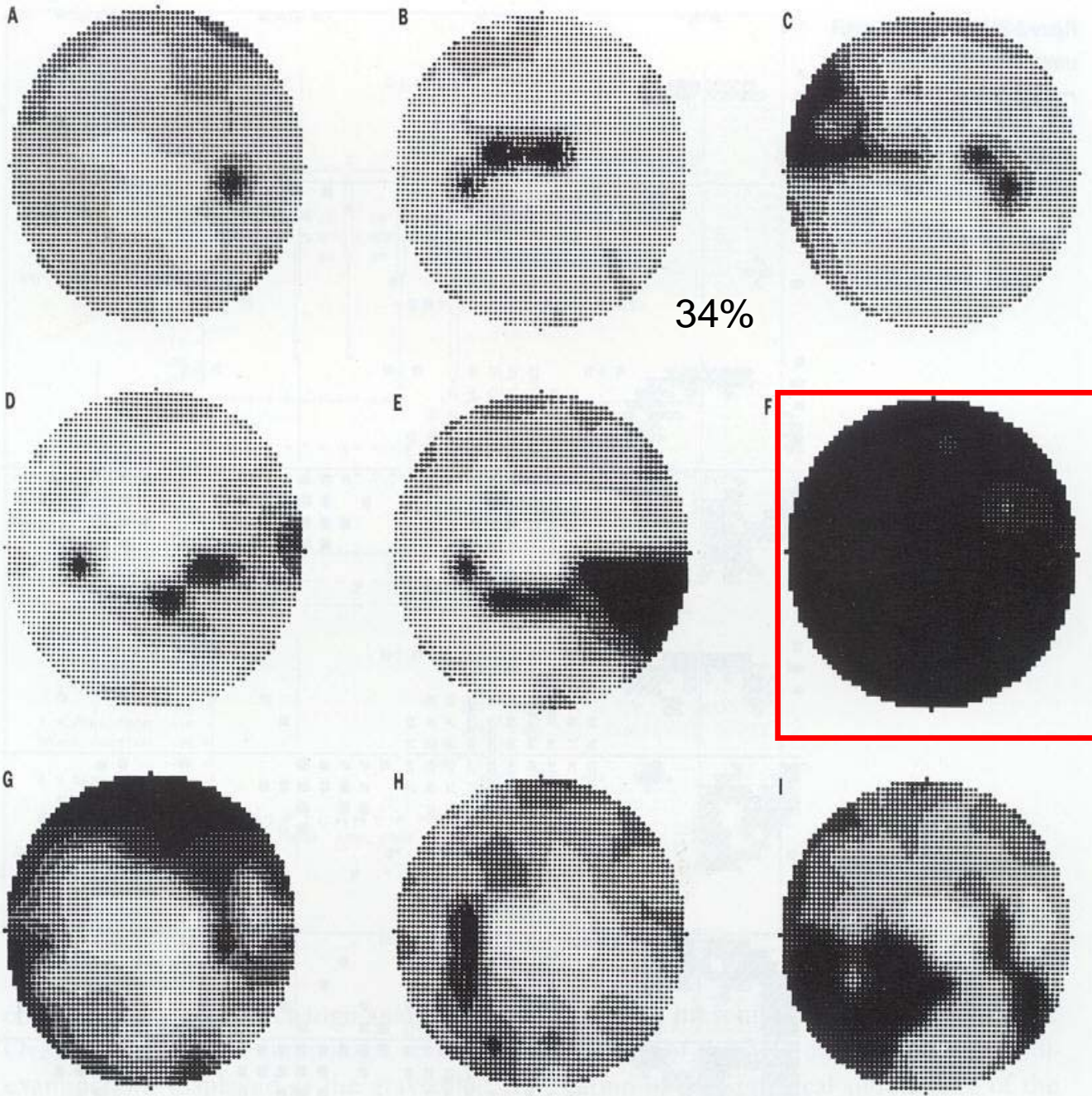
Visual field loss
A diffuse
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Figure 2.20. Examples of patterns of visual field loss.



Visual field loss
A diffuse
BD arcuate scotoma
CE nasal step
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Figure 2.20. Examples of patterns of visual field.



Visual field loss
F Blind

Figure 2.20. Examples of patterns of visual field.

Background to the discovery

- ◆ I was working on real-time adaptive changes of visual **brain neurons** in response to image motion
- ◆ Therefore I also had to know about other, earlier **adaptive image processing** in the **retina**
- ◆ My supervisor, Dr. Geoff Henry, was an ex-optometrist: “*we ought to be able to make a better test for glaucoma*” he said
- ◆ The strongest retinal adaptation occurs in a small subset (2%) of large optic nerve neurons
- ◆ These cells have properties that would make them a good test for glaucoma



The Discovery

- ◆ After yet another tea break where Geoff brought up the idea of glaucoma testing, ***I had the wrong idea***
- ◆ I went looking for a paper by David Burr
- ◆ I ***found*** a paper by Donald Kelly I had copied years before about something called the “**spatial frequency doubling illusion**” (**FD illusion**)
- ◆ As I re-read it occurred to me that **the illusion might be caused by those 2% of cells** important for retinal adaptation
- ◆ A few weeks later tests indicated that people with glaucoma had difficulty seeing the FD illusion...



Ted Discovers Intellectual Property

- ◆ I was directed to go to Anutech (now Office of Commercialization)
- ◆ Anutech in turn asked me to file a patent
- ◆ Anutech arranged for some market research
- ◆ They licensed the IP to an ANZ company (1989)



The Good, the Bad and the...

- ◆ The ANZ company fulfilled very little of their agreement after 1 year
- ◆ A friend of the company spoke on an airplane with a man from Welch Allyn (**WA**) USA (Skaneateles NY)
- ◆ I spoke with a Welch Allyn representative a few weeks later
- ◆ The ANZ company sold the IP to WA
- ◆ WA took a first refusal agreement and decided to fund research (1990)



Different Approach to Glaucoma Screening

- ◆ large trials began in February 1991 and carried on for nearly 2 years
- ◆ worked with WA engineers on hardware design for a test instrument prototype December 1993
- ◆ trials for USA FDA approvals occurred in early 1994, international trials
- ◆ on market 1997



Welch Allyn Notes

- ◆ We do not have similar companies in Australia
- ◆ Vertically integrated, doing all aspects of research, design, manufacturing
- ◆ Large international sales and service
- ◆ Several engineering teams constantly looking for new technologies at scientific conferences



Welch Allyn Notes

- ◆ Although WA is a large company they were not known in the perimetry area
- ◆ Largest perimetry market share belonged to Carl Zeiss Meditec
- ◆ Outcome: Welch Allyn did the design and then gave the marketing to Zeiss
- ◆ WE COULD HAVE DONE THAT!
- ◆ Well maybe not because we were unknown
- ◆ Second generation local?



Company Notes

- ◆ (dis-) Advantages of a large company
 - ◆ can take something that is just an idea through to a production model, do marketing
 - ◆ however they do more of the work & spend their money, **so you get less money**
- ◆ (dis-) Advantages of a small company
 - ◆ you have more control
 - ◆ bring your idea to a production model stage
 - ◆ then sell the more finished product (not just an idea) to a big company
 - ◆ you get more money (but the small company has less so **you will be under more pressure**)



Truefield

- Seeing Machines



Seeing Machines Notes

- ◆ We are currently building proto-types, obtaining government regulatory approvals
- ◆ Target = sell **ready-to-go** prototype to a large company to do the marketing and sales (a route to market)
- ◆ With a ready-to-go product the big company needs less convincing
- ◆ Maybe more than one big company will compete for your product





Commercialising Your Research



Commercialising Your Research

- Identifying what is commercialisable
- Steps to achieve commercialisation
- Restrictions on research
- Talking about it, disclosure
- Finding a partner
- Maintaining a partnership
- Benefits



Identifying the Commercial

- Need to know a bit about the market
- Can ask, supervisors, institute IP person, University Commercialization unit
- **Importantly** they are unlikely to have detailed knowledge of your product
- **You** will have to sell it, champion it, find partners

Identifying the Commercial

- knowing the market
 - who will use it? *cf.* MS, glaucoma
 - how fast/accurate does it need to be?
 - how many users?
 - in what countries?
 - what will the unit cost be?
 - what will the unit price be?
 - is there a government fee for its use?
 - do users need to like it?



Steps to commercialisation

- discovery
- protecting the IP
 - patent
 - petty or innovation patent (Australia)
 - non-disclosure agreements
 - copyright, trade mark, appellation
- licensing, partnership or start-up?

Steps to commercialisation

■ patenting

- an apparatus is patentable
- methods are patentable in some countries
- so the idea, or *'inventive step'*, that a gene, protein *etc.* can be used to a particular benefit is patentable providing
- the inventive step *'would not be obvious to a person skilled in the art'*
- n.b. often your university owns it (but see benefits)

Steps to commercialisation

■ IP licensing

- rather than selling, when companies disappear their (your) IP can disappear
- you earn royalties (regardless of profits), stay in the lab

■ partnership

- you and University partners with a company
- share profits (if any), stay in lab less

■ start-up

- you and University own it, drive it, no lab, biggest benefit, retire early (if successful)

Restrictions - when to patent

■ patent application

- cheap world wide protection for 1 year
- can add information to application in the year (money)
- must be able to file the **final specification** after 1 year
- can roll-over but then cannot publish in year
- wait? don't publish? improve patent?

■ patent – annual fees are expensive

■ can you just use nondisclosure agreements?

- Head of their and your company (Uni) to sign!

■ no protection, no benefit to anybody!

Finding a partner

- Can take time, see patenting
- You will need to sell it
- Some market research valuable
- Short write up
- University tech management can find/introduce but also keep your eyes open

Talking about it - disclosure

- University usually staff OK, but make sure they understand they may not pass it on
- Everybody else must sign non-disclosure agreement (NDA)
- Only some authorized University authorities may sign, they own it. Similarly a **signing officer** of the company



Maintaining a partnership

- Initially you are in the selling phase, you will have to resell it many times to different people in the company
- Eventually commercial decisions will win over science. Fight it, but be nice.
- Even in a start-up you are likely to become the 'R&D Director'

Benefits

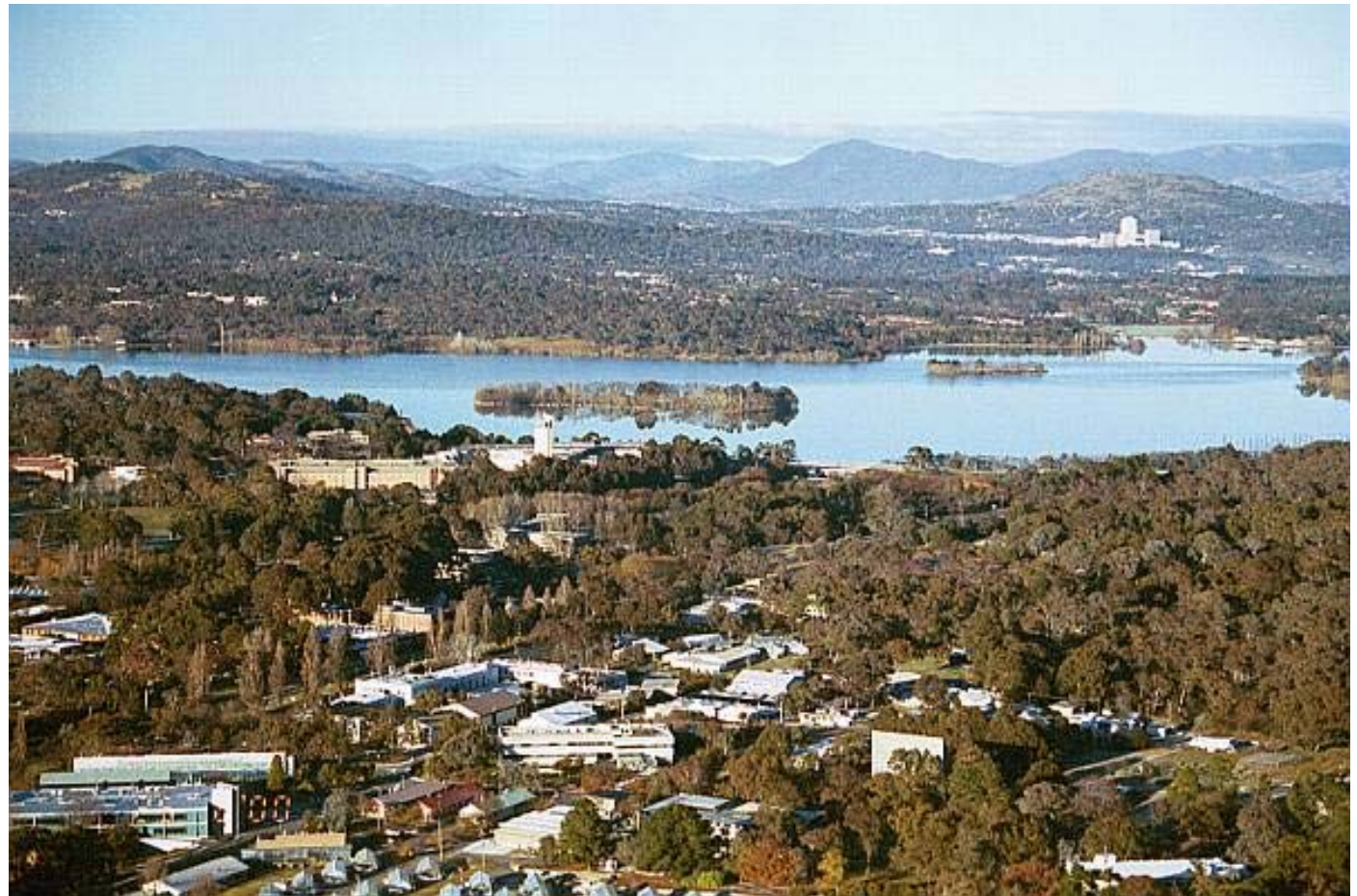
- Under the ANU intellectual property agreement you will get 35%, more if you do a start-up company
- Other universities are similar but do read the fine print before you sign on
- Australian CSIRO you get 0% unless you do a start-up, then you are partner

Conclusions

- Protect your and others IP
- Unprotected XXX and IP are bad
 - Father Ted says so
- Seek advice
- Know your market
- Be nice to all your partners
- Eat less fat

Thanks for listening!

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Anutech Notes

- ◆ Anutech protected the IP
- ◆ Educated me
- ◆ Made it happen
- ◆ Managed the research, contracts, etc.
- ◆ Are managing our new projects



spatial frequency doubling (FD) stimuli for glaucoma

“FDT perimetry may finally be a tool that can cost-effectively screen populations at risk”

Alward W (2000) Am. J. Ophthalmol. **129**, 376-8



FDT



Matrix

spatial frequency doubling (FD) stimuli for glaucoma

**“FDT abnormalities
preceded standard
automated perimetry
visual field loss by as
much as 4 years”**

Medeiros F et al. (2004)
Am. J. Ophthalmol. **137**,
865-71



FDT



Matrix

spatial frequency doubling (FD) stimuli for glaucoma

- **“Retinal nerve fiber layer damage as assessed by OCT in eyes with a visual field defect detected by FDT perimetry but not by standard automated perimetry”**

Kim TW et al. (2007)
Ophthalmol. **114**:1053–7



FDT



Matrix