
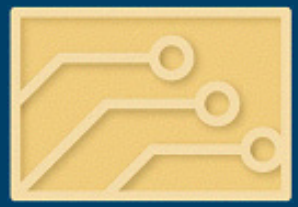


Creating Value from Intellectual Property and Transfer of Technology

Martin Sandford – Senior Vice President

Performance Management & External Affairs

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Agenda

- My Background
- A brief overview of BTG
- BTG Case Histories
- Lessons learned

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My Background

- B Sc Civil Engineering - 7 years on harbours (1971-78)
- MBA – London Business School (1978-80)
- Financial Planning & Venture Capital (1980-84)
- BTG from 1984
  - BioTech Investments (1984-86)
  - Science Division (1986-95)
  - Medical & Physical Science Division (1995-99)
  - Health, Medical & BioTechnologies (1999-2002)
  - Director of Operations for whole of BTG (2002 onwards)
- Also, Vice President LES Britain & Ireland

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BTG's Business

Creating value *through investing in IP and technology, and in early stage ventures*

Realizing value *through technology licensing, patent assertion and the sale of equity*

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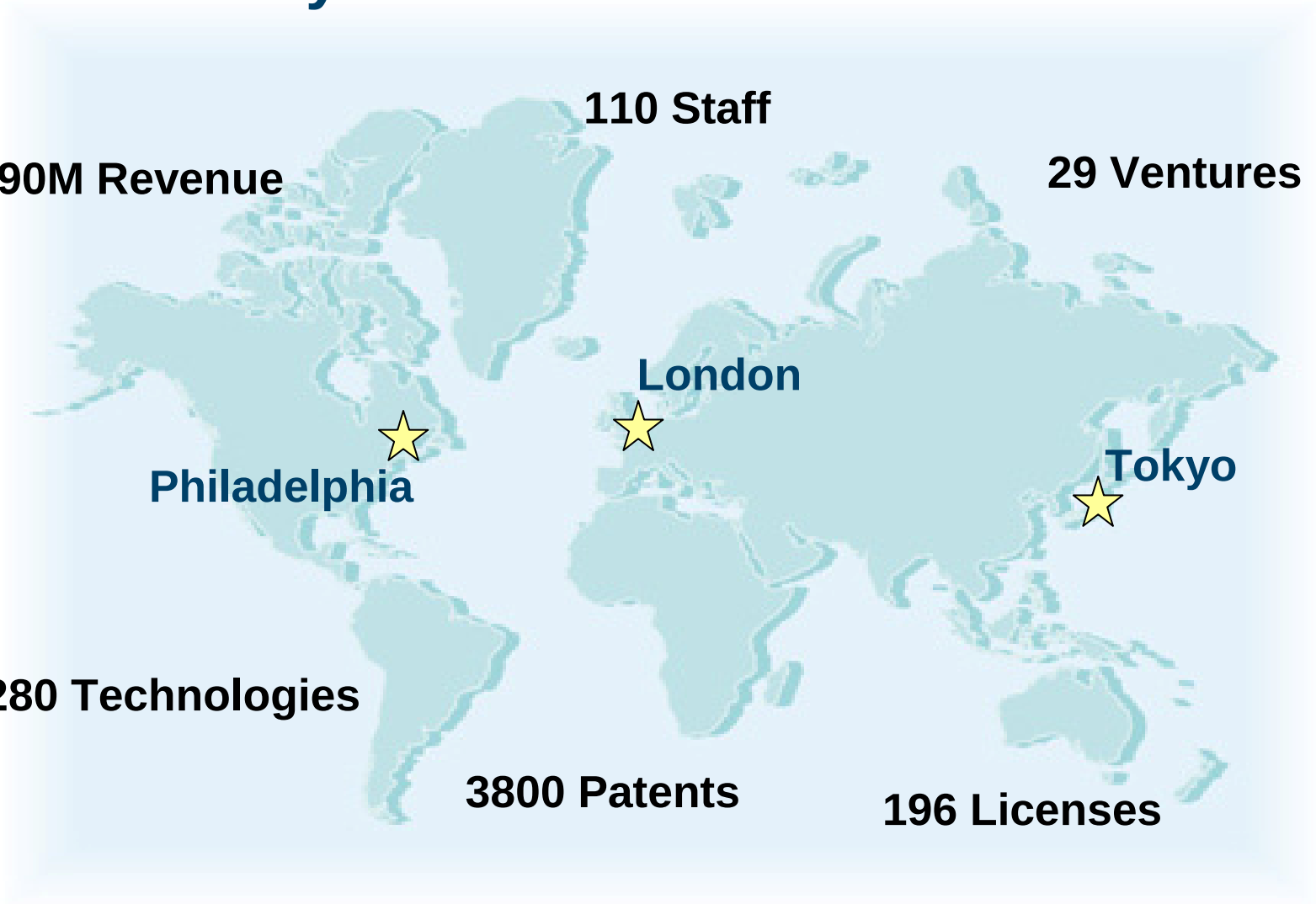
BTG – Key Statistics



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McALLE01:

build

BTG's History

National Research Development Corporation Founded

1948

1950s

1957 **Interferon** discovered

1958 **Hovercraft** story

1960s

1960 Continuously Variable Trans-mission (**CVT**)

1964 **Cephalosporin** antibiotics

1966 **Pyrethrin** insecticide

1970s

1971 **Cholesterol Assay** tests

1972 **Interferon** US patent granted

Glass Ionomer cement for dentists

1974 Oxford **3-part knee**

Magnetic Resonance Imaging (**MRI**)

1975 **National Enterprise Board (NEB)**

1980s

1980 **NRDC & NEB form BTG**

1987 **MRI** licensed to General Electric

1988 **Torotrak** formed

1990s

1990 BTG opens US office

1992 BTG Privatised

1995 **Floated on London Stock Exchange**

1996 **Disposable Contact Lenses**: Bausch & Lomb

1997 FDA: **Factor IX** treatment for Hemophilia B

Two-part hip cup

1999 Provensis Ltd: **Varisolve™**

2000s

2000 **Rights Issue raises approximately £121.5M**

2001 EU approval for **MabCampath™**

US FDA approval of **Campath™**

2003-4 BTG invests £15.4M in 21 early stage technology companies, including 10 first time investments

2004 **Rights Issue raises approximately £26.6M for further development of Varisolve®**

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How do you make money from IP?

- Sell it
- License it
  - And Audit licensees
- Start a company round it to make product
- Assert it with the end objective of
  - Licensing
  - Damages
  - Putting competitor out of business = greater margin

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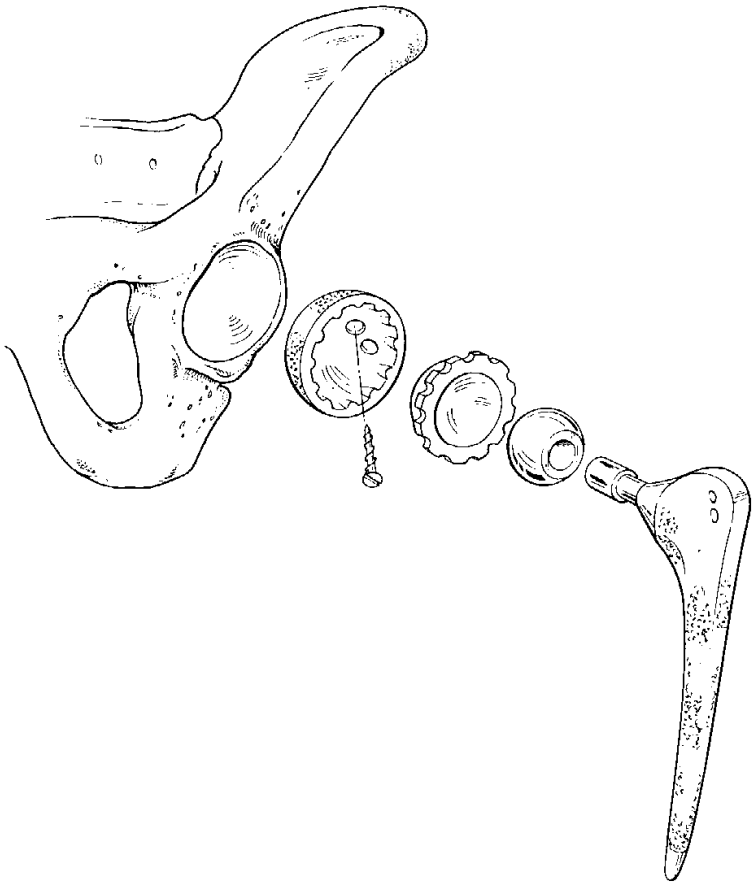
BTG Case Histories

- 2 Part Hip Cup
- Cephalosporin
- Scorim
- Varisolve
- MRI

Two Part Hip Cup



Two Part Hip Cup

- Technology avoids compromise
- Achieves correct geometry
- BTG filed patents
- Interference declared at USPO
- J&J buy JMP
- BTG and J&J agree to arbitration

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Two Part Hip Cup

- Agreement on arbitration and licensing
- Arbitration decided September 1996
- BTG licenses:
  - Osteonics
  - Howmedica
  - Biomet
  - Smith & Nephew
  - Wright Medical

Two Part Hip Cup

- Why did we take it on?
  - Neat engineering solution giving patient benefit
- What was the key factor for success?
  - Winning the interference in the USPTO
- Lessons learned
  - IPR can be traded to achieve “Win-Win”

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Cephalosporin
Sardinia 1945

Cephalosporin
Oxford 1959

Cephalosporin
The Products

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Cephalosporin

- 1945 - Sardinia, anti-bacterial fungus found
- 1948 - Culture reaches Oxford, Italian publication
- 1953 - Not one, but three anti-biotics found (N & C)
- 1959 - Chemical structure postulated & confirmed
- 1959 on - Fermentation processes improved &
  Cephalosporin nucleus produced
- 1964 - Injectable Cephalosporin on market
- 1969 - Cephalosporin tablets

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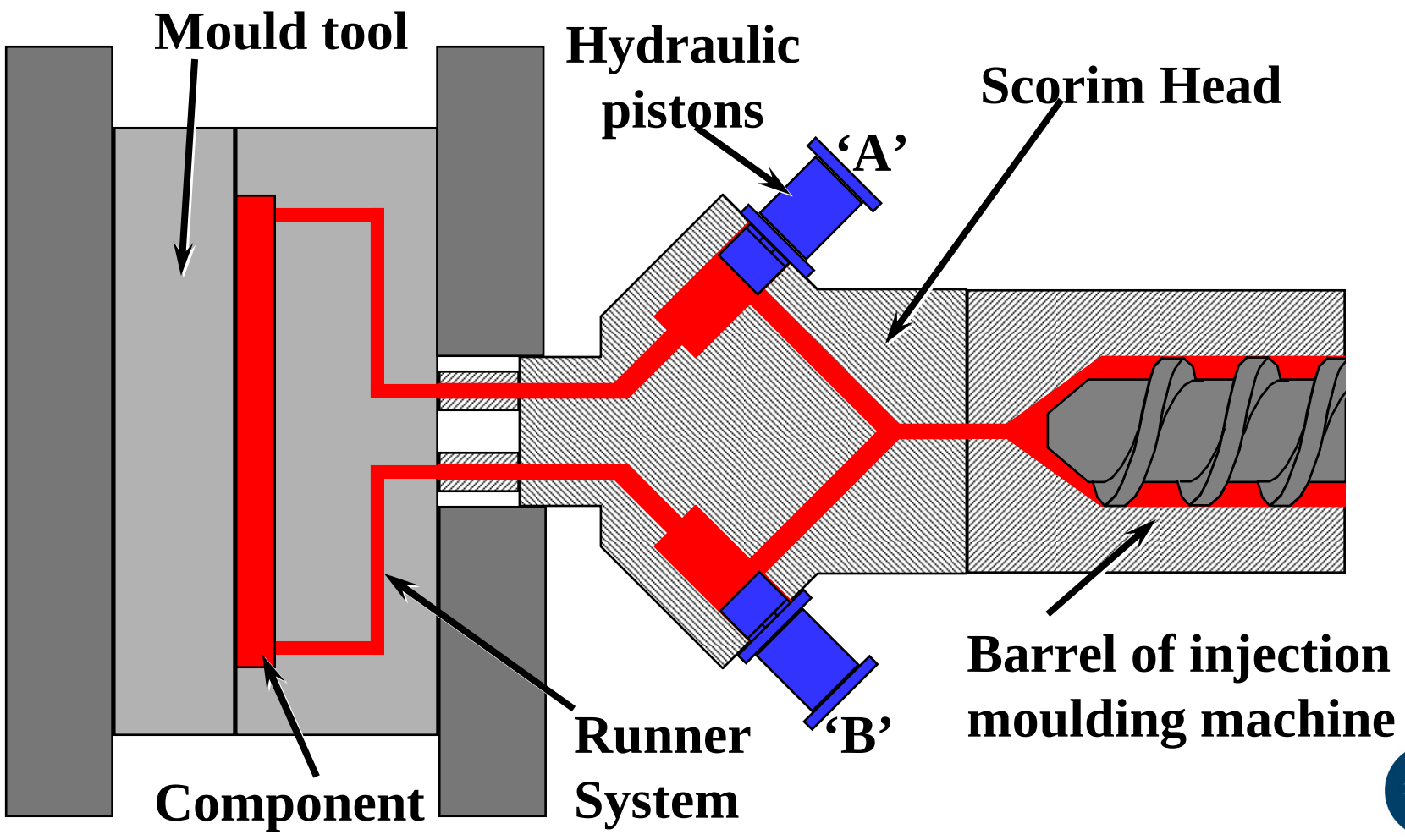
Scorim – Injection Moulding



Opportunities

- Can move or remove weld lines and sink marks
- Proven to increase strength
- Enables PP to replace ABS - cheaper and better re-cycling
- Fibres can be inserted and oriented
- No cycle time penalty

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Problems

- Cosmetics are subjective
- Effective cost of painting has dropped
- Designers, specifiers, customers and moulders all ultraconservative
- So strength improvement not immediately usable
- Value is in the product improvement, but the licensable item is a piece of (expensive) manufacturing equipment

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Scortec

- Why did we take it on?
  - Huge potential from increased structural use of polymers
- What was the key factor for success?
  - Getting injection moulders to adopt the technology
- Lessons learned
  - You must understand the dynamics of the market
  - Some industries have to be spoon fed
  - Recognise when you are not succeeding and stop
  - You need to understand the value proposition

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Varisolve®: Varicose Veins

“Before”-1994 treatment **“After”- 1999**

- Female, 28
- Primary varicose veins
- Sustained outcome
- Difficult to achieve with surgery

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Varisolve®

- Why did we take it on?
  - Spanish patent attorney drew our attention to this serious opportunity offering huge patient benefits
- What is the key factor for success?
  - Getting the technique to market in a form that will yield return on the value of the service
- Lessons learned
  - You can measure delays in £'000's lost per day against a fixed life for the patents
  - Getting through the FDA process is expensive and unpredictable

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Magnetic Resonance Imaging (MRI)

- Funded development of technology from 1974-1980 from Nottingham (Peter Mansfield) and Aberdeen Universities
- BTG combined the IP from three different universities creating a true technology portfolio
- Clinical equipment became available in 1983 and was in clinical use in 1985
- Between 1986 and 1989 99% of the world's MRI manufacturers were licensed including GE, Marconi, Siemens, Toshiba, Hitachi and Shimadzu, Bruker, Fonar and Esaote.

2003 Nobel Prize for Medicine: Sir Peter Mansfield

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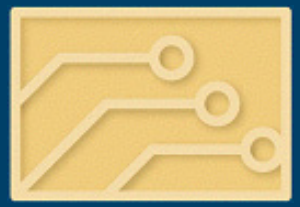


Lessons Learned

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Evaluation of Opportunities -1

- Reality check
  - The “So what?” test: What’s the real impact?
- Technical assessment
  - Is the technology credible & robust?
  - Will it scale up?
  - How much of a technical advance is it?
- Market assessment
  - Bottom-up assessment of real usage
  - Top-down assessment of market penetration
  - How discontinuous is it?
  - Competition?

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Evaluation of Opportunities - 2

- Patent Assessment
  - Patentability
  - Policeability
  - Enforceability
- Financial Assessment
  - Royalty potential
  - Net Present Value
- Route to market
  - What is appropriate and will it be acceptable?

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Traps for the unwary

- This technology offers a huge cost saving !
  - but actually, the costs of production are very low and the companies active in this market have FDA approval using a more expensive process
- There are a huge number of uses for it !
  - yes, it could be used in many of these applications but there are alternatives which are tried and tested
- We know the technology best and can do the development !
  - maybe, but where would it best be done?

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Why no mention of LDC's?

- BTG has sourced virtually all its technologies from UK, Europe, USA and Japan
- BTG tried to find new insecticide leads from botanical sources worldwide, but nothing commercial emerged
- Best prospect was a nematicide where the chemistry was so complex, the product would have been a plant extract

A few thoughts on indigenous knowledge

- Compare with Cephalosporin – Sardinian discovery, British Invention – was that ‘fair’?
- Pyrethrin Analogues – lead was pyrethrum; after 20 years of research, chemists found highly active analogues
- Firm, clean patent positions, with no other obligations, are what licensees seek
- 2% of all patents valuable, so many in G8 resistant to anything that adds risk or cost
- The answer? LDC’s to file patents in US (50% value)?

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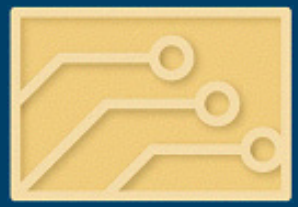


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