Building a (Successful) Research Group

Workshop at the Heidelberg Laureate Forum 2014

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Introduction

There is no recipe for success

[e.g., Richard Branson]

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but, if you insist,

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but, if you insist,

Chance favors the prepared mind

[Louis Pasteur]

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It’s your choice

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It’s your choice

You can work alone

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It's your choice

You can work alone

or in a team

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The Question of the Day

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The Question of the Day

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- e.g., like founding a small company

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- better research (quality, impact)
- better career prospects (for everyone involved)
- better feelings (being at home)

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- e.g., like founding a small company

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- better feelings (being at home)

working alone as in

- being responsible for oneself only
- collaborating loosely with others

Remarks:

- I haven't build a research group myself; I am part of a group, though
- I am biased towards the German academic system
- I am biased towards computer science
- I'll raise more questions than giving answers to them

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Pillars of a Research Group

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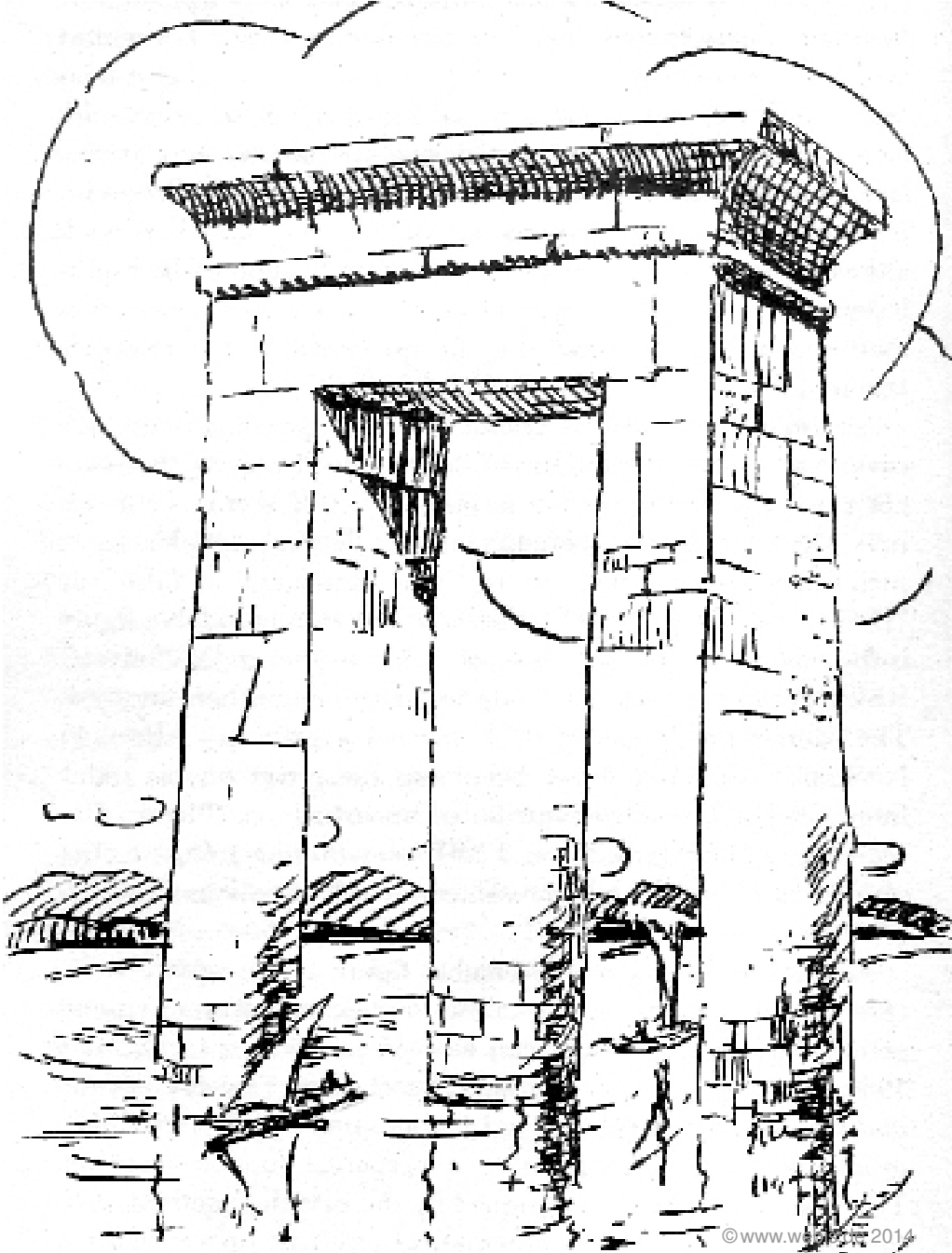
There's

1. People
2. Research
3. Funding

all of which
brought together by



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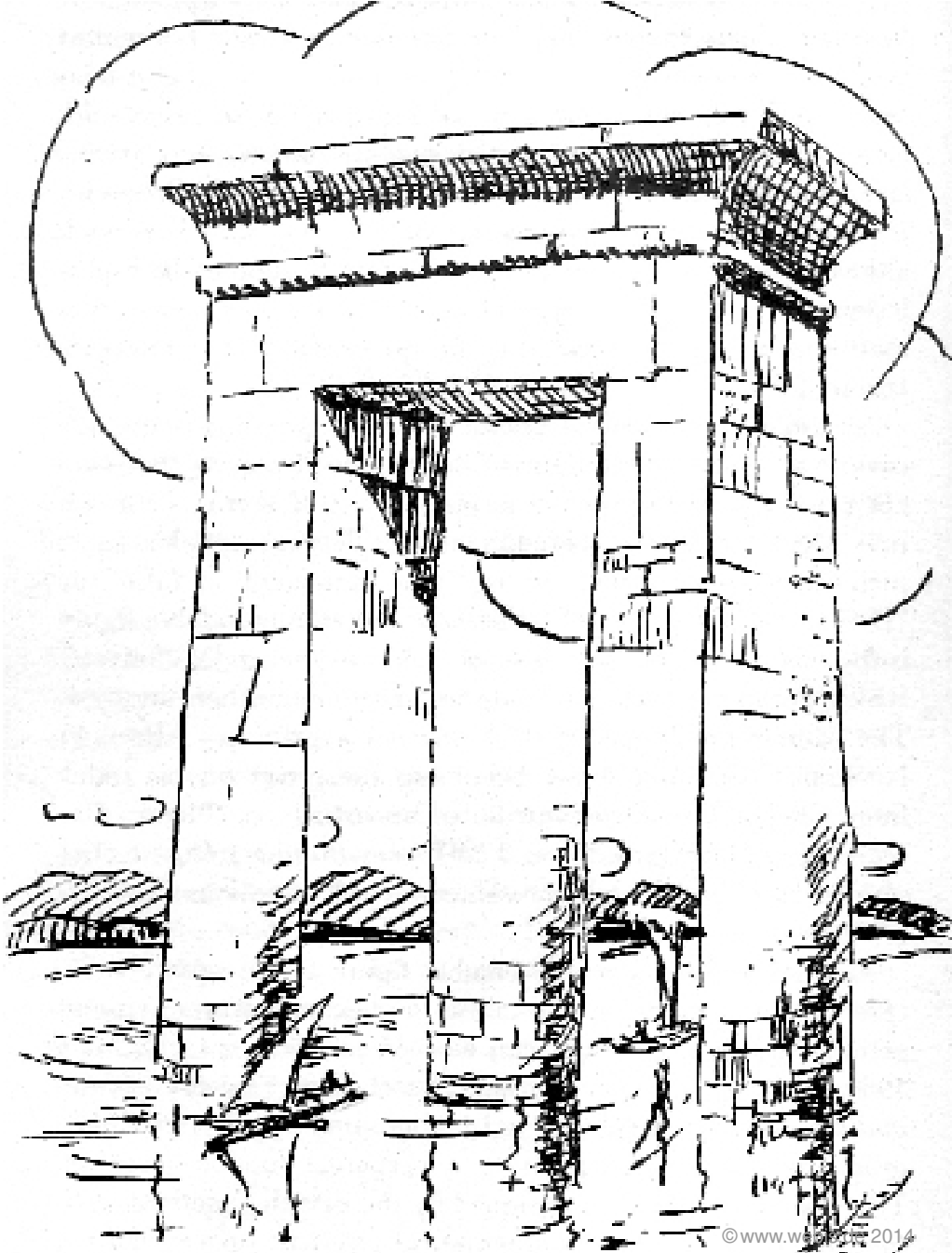

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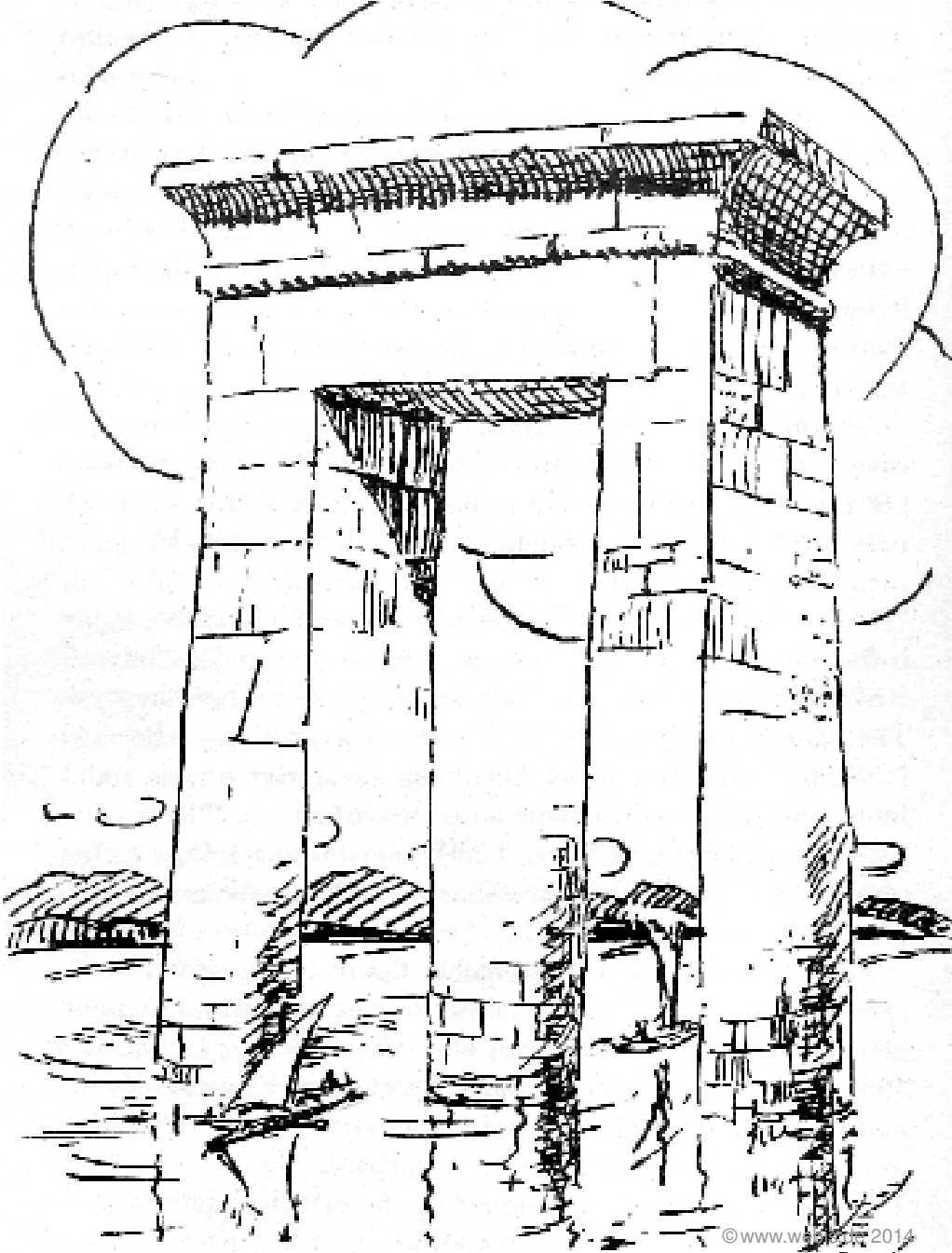

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You

Remarks:

- At the workshop, Ivan Sutherland, winner of the 1988 Turing award, suggested the following amendments: “Research” should come first, and it should be replaced by “Problem”, say, the primary research goal of a research group.

People

People

The Webis Group


Khalid Al-Khatib


Tim Gollub


Steve Göring


Matthias Hagen


Johannes Kiesel


Martin Potthast


Martin Trenkmann


Michael Völske


Henning Wachsmuth


Benno Stein

[www.webis.de]

Questionnaire Results

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Are you member of a research group?

Yes: 93% (41 / 44)

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Are you head of a research group?

No: 86% (38 / 44)

Do you plan to pursue a career as a scientist?

Yes: 89% (39 / 44)

People

In One Person

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In One Person

Recruiter

Leader

Motivator

Mentor

Politician

Marketer

Organizer

People

In One Person

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Organizer

- Become a talent scout
- Learn to interview people

- Were you ever directly involved in hiring a research scientist?

People

In One Person

Recruiter

Leader

Motivator

Mentor

Politician

Marketer

Organizer

and, time permitting,

Researcher

Remarks:

- Again, Ivan Sutherland remarked that leadership comes first and is the most important thing that keeps a group together. He further made two suggestions:
- In his experience, one cannot learn anything from an interview when hiring a scientist. Instead, the only thing that really helps in making a decision whether or not to hire someone is to talk to someone off-the-record who knows the applicant.
- In a group meeting, answers should always be given in the order of increasing seniority, so that junior researchers have no chance of hiding behind the senior ones and so that they have to come up with their own original thoughts.

Research

“You and Your Research”

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Talk at Bell Labs in 1986 on how to do great research [transcript]

Richard Hamming (1915-1998)

Turing Award 1968

Research

“You and Your Research”

Talk at Bell Labs in 1986 on how to do great research [transcript]

Characteristics of a great researcher:

- Courage (pick important problems)
- Humility (accept basic problems)
- Drive (work more)
- Skepticism (of one’s own work)
- Focus (i.e., no distractions)

Less effective characteristics include luck, brains, youth, ego, anger, non-conformism, and self-deception.

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Questionnaire Results

List the ways you know by which the success of a scientist is measured today.

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1. Publications (33 mentions)
   - by count (21) and
   - rank of the venue (11) and
   - whether one is lead author (1)
2. Impact (29)
   - as such (15) and
   - as measured by citations (14)
3. Funding (25) by amount of money acquired

Questionnaire Results

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2. Impact (29)
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3. Funding (25) by amount of money acquired
4. Students taught (16) and what became of them
5. Network (12) by number and rank of collaborators (7), by (prior) affiliation (3), and by recommendations (2)
6. Awards won (11)
7. Professional activities (9), namely event organization (4), program committee work (2), invited talks (2), and other committee work (1)
8. Publicity (6)
9. Science transfer (5) such as patents (3) and products developed (2)
10. Career steps (3) and the time it took to take them
11. Personal skills (2)

Research

You and Your Research Group

Research

You and Your Research Group

Dos

- Support
- Availability
- Interest and enthusiasm
- Domain knowledge and expertise
- Interest in a student's career
- Good communication
- Constructive feedback
- Direction and structure
- Approachability and rapport
- Experience and interest in supervision

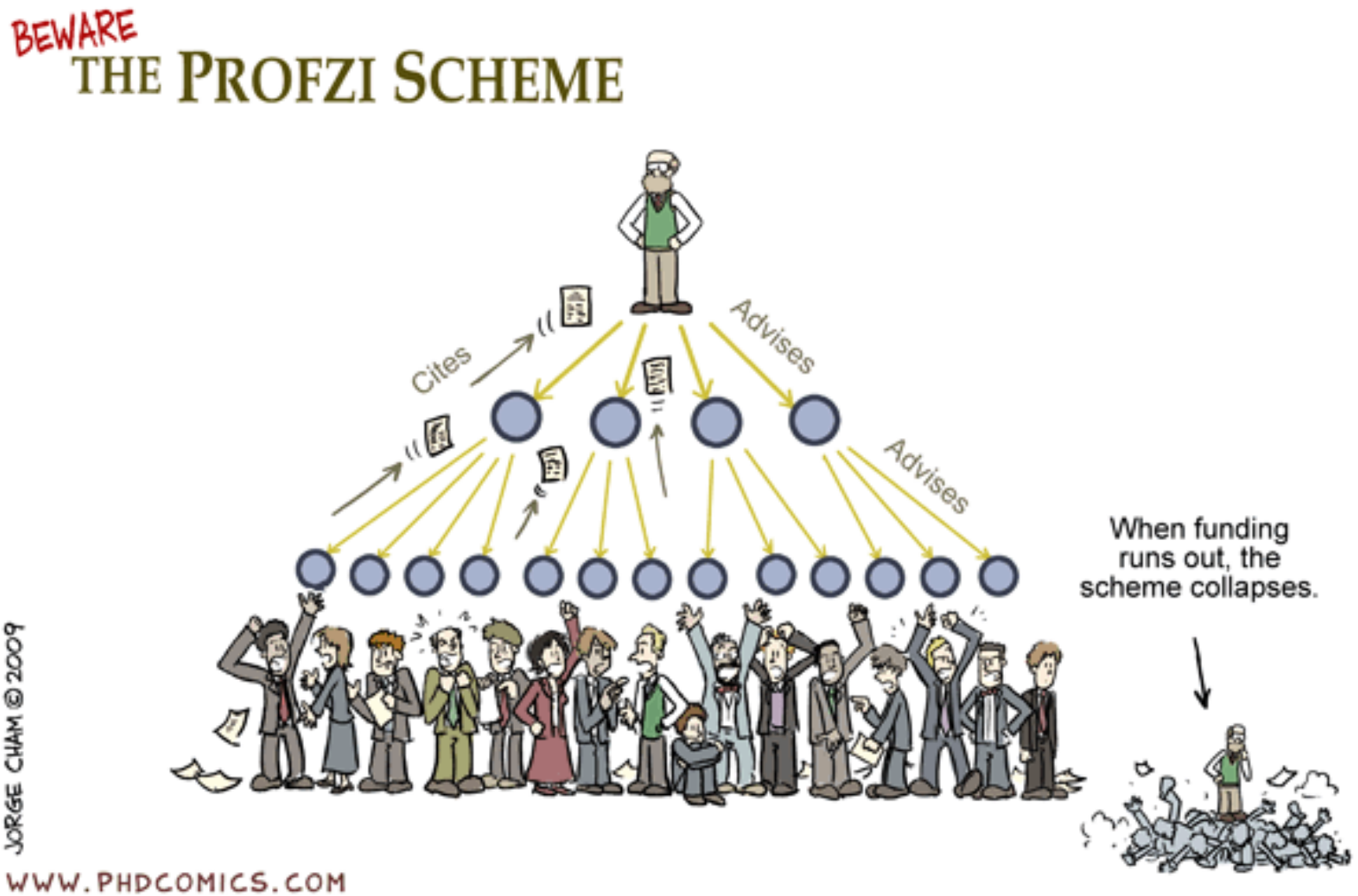
Don'ts

- Too busy to supervise
- Poor feedback
- Lack of commitment and interest
- Conflicts among co-supervisors
- Poor communication or disagreement about the project
- Unrealisitc expectations
- Selfishness and disrepectfulness
- Not being up-to-date with the field
- Lack of research experience
- Personality clashes

[source]

Research

You and Your Research Group



Funding

Once you’re famous, getting funding is easy...

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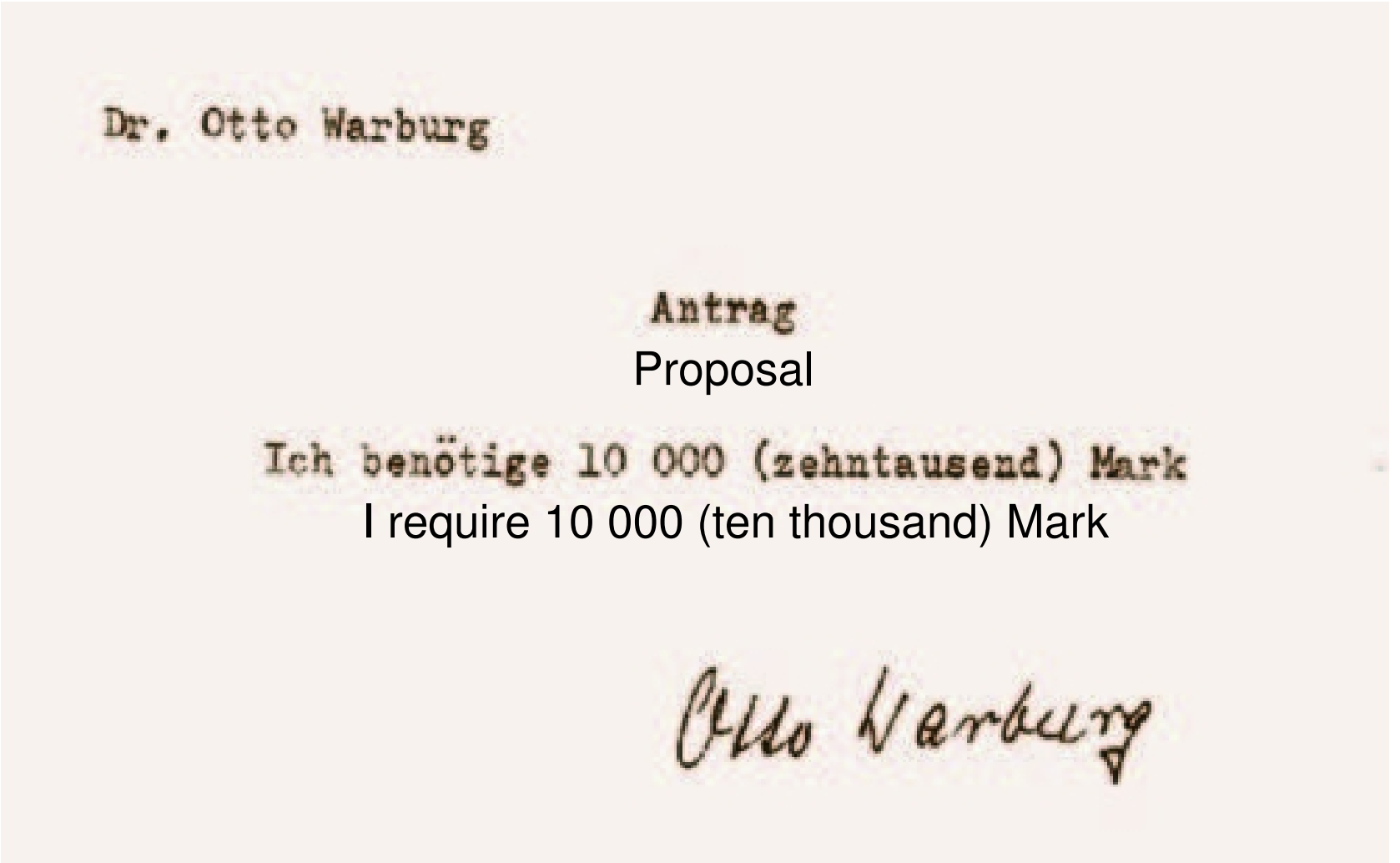


Dr. Otto Warburg

Antrag

Proposal

Ich benötige 10 000 (zehntausend) Mark

I require 10 000 (ten thousand) Mark

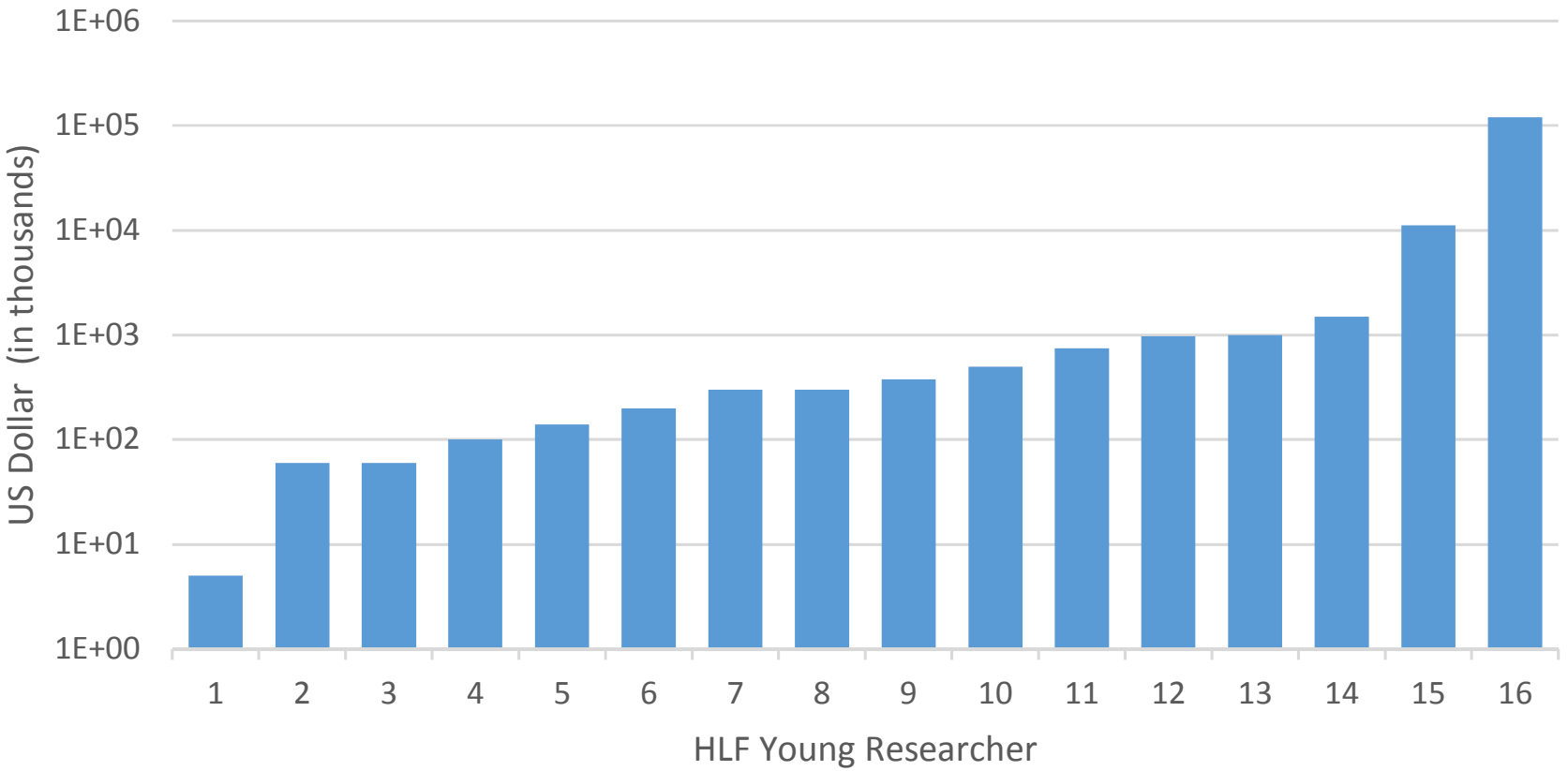
Otto Warburg

Remarks:

- Otto Warburg (1883-1970), German physiologist, received the Nobel Prize in Physiology or Medicine 1931, was nominated for the Nobel prize an unprecedented three times for three different discoveries, received the Pour le Mérite (Civil Class) 1952, and was a fellow of the Royal Society.
- The proposal shown is a reproduction of a proposal that he allegedly submitted in 1921 to the Notgemeinschaft der Deutschen Wissenschaft (Emergency Association of German Science) and that was funded in full. It was originally published in Willem H. Koppenol, Patricia L. Bounds and Chi V. Dang, Otto Warburg's contributions to current concepts of cancer metabolism, Nature Reviews Cancer, Vol. 11, May 2011, pp. 325-337.
- In 1921, during hyper inflation, a German Mark was still worth about 1/10th a German Goldmark, the gold-backed currency that was used up until World War I. The buying power of 1 Goldmark in 1914 equals 4.87 Euro today, so that Warburg effectively asked for a grant of about 4870 Euro (6255 US Dollar).

Questionnaire Results

How much money have you successfully helped to acquire?



Some Open Questions

Upper/lower limits:

- How many people are enough?
- How much money is enough?
- What research would you carry out with no limits on people and money?

People:

- How to choose the best candidate for the job?
- When is a PhD student ready to finish his/her PhD?
- How much does a PhD student cost?

You:

- Do you wish to build a research group?
- Do you wish to maintain a hands-on feeling and do things yourself?
- What are your questions?

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Time to get you involved...

Thank you!

Remarks:

- During the workshop, Matt Lease from the University of Texas at Austin, head of a group of 5 researchers, joined the discussion with much enthusiasm. He also provides a couple of additional reading tips:
- Ivan Sutherland (Turing Award, 1988): Technology and Courage
- Imre Leader, June Barrow-Green, Timothy Gowers. The Princeton Companion to Mathematics. VIII.6 Advice to a Young Mathematician
- Farther afield, the following publication has a variety of discussion about the importance and value of working on hard problems, as well as stories of how Hilbert and other mathematicians approached such questions themselves. It's less direct than the reference above, but suggests in general how biographies / histories of mathematicians and computer science may also carry lessons and inspiring stories for us today:
- Rüdger Thiele. Hilbert's Twenty-Fourth Problem. The American Mathematical Monthly, Vol. 110, No. 1 (Jan., 2003), pp. 1-24.

Questionnaire Results

Were you ever directly involved in hiring a research scientist?

No: 68% (30 / 44)