



# FORMATIVE YEARS

HANS FREUDENTHAL IN  
PRE WAR AMSTERDAM

HARM JAN SMID



HANS FREUDENTHAL

Freudenthal went to Amsterdam in 1930 .

He became asistant to L.E.J. Brouwer.

Focus on mathematics (topology).

Acitvities on mathematics education  
after the war.

But interest for and discussions on ME already  
before the war.

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L.E.J. BROUWER 1881- 1966

“My educational interpretation of mathematics betrays the influence of L.E.J. Brouwer’s view on mathematics (though not on education)”.

Freudenthal in the preface of  
“Mathematics as an educational task”.



DAVID VAN DANTZIG 1900 - 1959

“I read Van Dantzig’s articles [on mathematics education] already before I came to The Netherlands and I have to admit that they impressed me very much.”

Freudenthal in a memorial speech on occasion of Van Dantzig’s death.





Gerrit Mannoury 1867 - 1956



TATYANA EHRENFEST-AFANASSJEWA 1876 - 1964

“A person I should have mentioned in the preface (...) is Mrs. T. Ehrenfest – Afanassjewa”.

Freudenthal in a letter to Geoffrey Howson.



L.E.J. BROUWER 1881- 1966

Famous for his work on topology and the foundations of mathematics: intuitionism.

In the twenties clash with Hilbert.

In 1927 lectures in Berlin on intuitionism.

Brouwer and Freudenthal meet.

What did Freudenthal mean by:

“My educational interpretation of mathematics betrays the influence of L.E.J. Brouwer’s view on mathematics (though not on education)”.

“Look what I have built for you out of the structural elements of our thinking. – These are the harmonies I desired to realize. This is the scheme of construction which guided me – Behold the vision which the completed edifice suggests to us, whose realization may perhaps be attained by you or me on one day” (Brouwer)




Dirk van Dalen

# L.E.J. Brouwer

Topologist, Intuitionist, Philosopher

How Mathematics  
Is Rooted  
in Life

 Springer



Hermann Weyl:

“Mathematics is more a doing than a theory.”

Brouwer was not interested in education, but Freudenthal was.

Freudenthal: “Mathematics as an human activity”.

Brouwer’s concept of mathematics  
can indeed be found in Freudenthal’s  
ideas how mathematics should be taught.

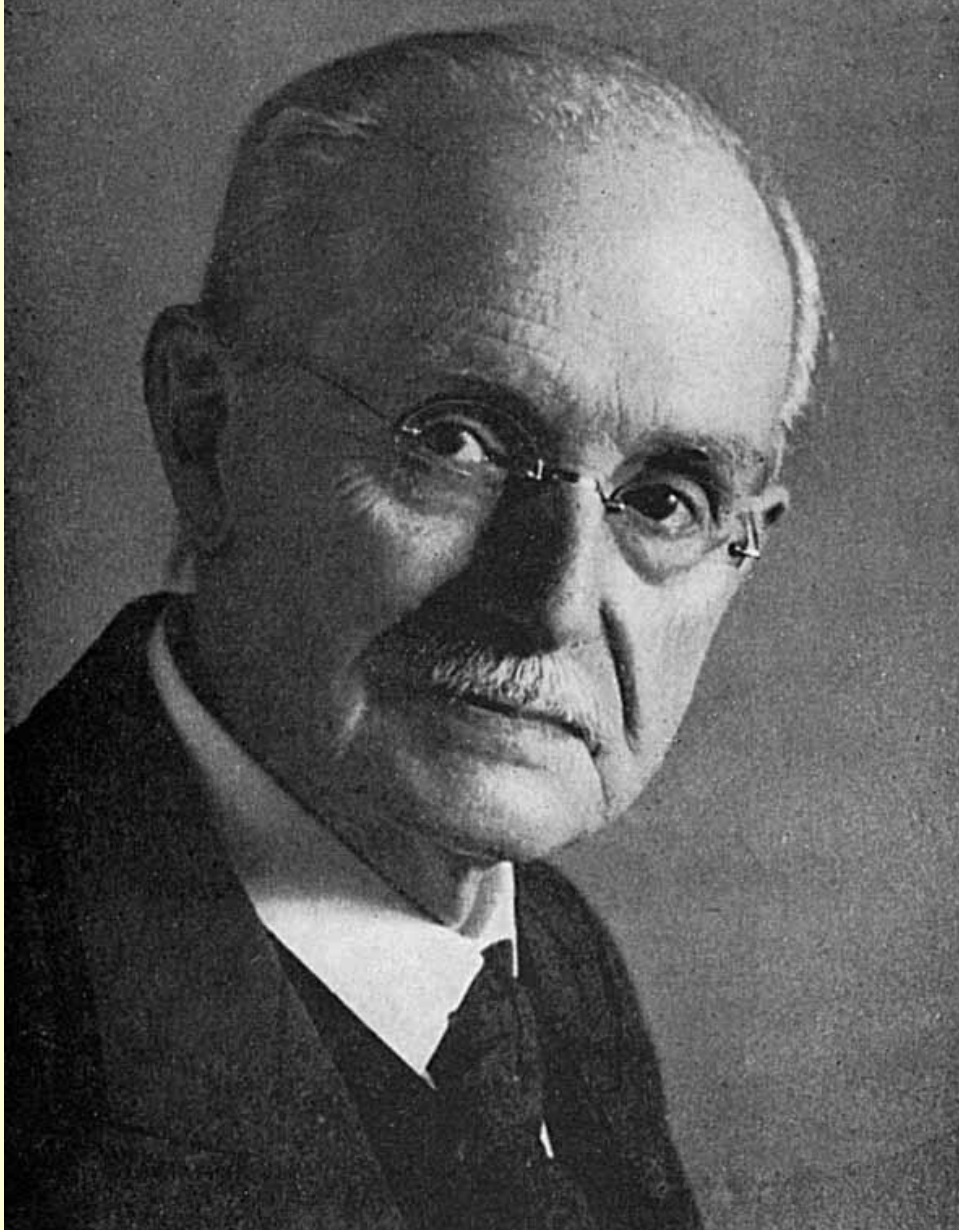


DAVID VAN DANTZIG 1900 - 1959

Van Dantzig published some interesting articles on teaching mathematics in 1927 and 1929.

Freudenthal read them before he came to Holland and was impressed.

Van Dantzig was deeply influenced by Mannoury



GERRIT MANNOURY 1867 - 1957

Mannoury was almost a mathematical autodidact.

“There is no such thing as transfer.”

“Math teaching as it is done now is a crime; to mathematics itself and to the children.”

Van Dantzig's 1927 article about the  
"Social significance of teaching  
mathematics".

At the moment almost nothing.

No transfer, should be given completely  
different.

But how?!

Freudenthal:

I am convinced that I rejected the idea of learning mathematics as a mean to “learn to think” already when I gave the “didactical colloquium” [that was in 1932]

(Freudenthal 1987)



The 1929 article about teaching mechanics.

“Ready-made mathematics do not arouse anybody’s interest”.

“It is necessary that also in schoolbooks the process of *mathematization* is actively carried into effect.”

(Van Dantzig 1929)

Freudenthal in *Mathematics as an Educational Task*:

“There is no mathematics without mathematizing. (...) This means teaching or even learning mathematics as mathematization”.

(1973)



TATYANA EHRENFEST-AFANASSJEWA 1876 - 1964

Born in Kiev in 1876.

Educated in St. Petersburg, studying math and physics at the Women University, math teacher training.

Studying with Klein and Hilbert in Göttingen.

Married Paul Ehrenfest, return to Petersburg. Involved in teaching experiments.

In 1912 with her husband to Leiden in the Netherlands.

Lived there until 1964.

Published articles on geometry teaching and formed a discussion group.

Believed in the possibility of transfer, but not unconditionally.

Pleaded for an intuitive propedeutic course in geometry.

Freudenthal to Howson:

“I partly developed my ideas on the teaching of mathematics by opposing hers.”

In 1951 they published together a brochure in which they discuss the problem of transfer.

# UEBUNGENSAMMLUNG

ZU EINER  
GEOMETRISCHEN PROPÄDEUSE

von

T. EHRENFEST-AFANASSJEWA



HAAG  
MARTINUS NIJHOFF  
1931



30. Someone walks along the edge of a quadrangular square, departing from the middle of one of the sides.

Which angle did he pass through when he arrives at his starting point? The same question for a triangular, a pentagonal and a round square. The same question when he describes a shape in the form of the number 8.

31. The pupil should, on his way from home to school, on a piece of cardboard draw all angles he passes through on each crossing point he passes, by which he must determine which angle the front of his house makes with the front of the school. Let him control his results by means of a map when the streets are not straight, and draw his attention to possible mistakes.

Maybe influenced by Semen Il'ich Sjochor'-Trotskij, a Russian math educator.

Freudenthal (already in 1932) very enthusiastic about it, recommended it to his students

“A masterpiece, but I saw its importance only later on”.

Clear influence on the “realistic”  
geometry for elementary education as  
developed in the seventies by  
Freudenthal and his group (Wiskobas)



Working on an assignment from Wiskobas

Freudenthal to Howson (1983)

“It [that is the method of re-invention] dawned upon me when I was studying the work of T. Ehrenfest and her disciples, both in their classrooms and in discussions with them”.

Freudenthal's prewar years in Amsterdam:

Influences by Brouwer on his educational interpretation of mathematics

Influences by Van Dantzig and Mannoury concerning "transfer", social significance of teaching math, and "mathematization".

Organized a didactical colloquium,  
participants Pierre van Hiele and Dina  
Geldof

Became enthusiastic about ms.  
Ehrenfests “Uebensammlung”.

Formative years: slowly building on his  
educational framework.

Would bear fruit after the war!