The Royaumont Seminar 1959 and Freudenthal's Involvement

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Abstract

As it is already common lore in the history of mathematics education, Hans Freudenthal had been invited to participate at the Seminar on New Thinking in School Mathematics, held in Royaumont in 1959, organised by the OEEC (later renamed OECD), but had rejected the invitation – and that he regretted later on this refusal as a great error, assuming he might have impeded the worst of what he then thought to be a wrong way for modernisation (de Bock & Vanpaemel 2019, p. 75). La Bastide-van Gemert was already able to shading and differentiating this common lore, by researching in Freudenthal's Nachlass (La Bastide-van Gemert 2015). The focus of her analysis was to study Freudenthal's individual acting regarding the invitation. As I had shown in my research upon this Seminar, which in fact launched the modern math movement internationally, the archive of the OECD had no longer documents of the preparatory stages of the Seminar; all that had been simply littered (Schubring 2014). Not only Freudenthal's correspondence with the OEEC staff, but also a number of documents he received during the preparatory stages of the Seminar enable, however, to reconstruct somewhat the preparations by the OEEC and by a "group of experts", which should assist them in elaborating the programme.

These documents allow not only to understand the concretisation of the conceptions for the Seminar, but also to remark that Freudenthal's participation in the preparatory changes had instigated effects upon the Seminar conceptions. This contribution analyses these developments and elaborations. As a major surprise, one of the key elements of the lore is shown to be wrong. In a last section, I will report on my searches for information about the three West-German Seminar participants: Hermann Athen, Otto Botsch and Heinz Schöne.

Keywords: Royaumont Seminar, Freudenthal participation, criticism Seminar conception, failure of New Math?, West-German participants

The Lore

The relation between Freudenthal and the Royaumont Seminar of 1959 constitutes a recurrent issue in the discussions about the modernisation of mathematics teaching, in mathematics education. The lore, telling that Freudenthal had deplored not to have participated, has been created by himself.

This is evidenced, for instance, by a paper of Wim Neeleman of 1991, in a Brazilian journal (Bolema). Neeleman, a Dutch master student, supervised by Michael Otte in a Brazilian university, reports:

> With these ideas about mathematics education, it is not surprising that Hans Freudenthal was among the first critics of the so-called "modern mathematics" movement. In fact, in a letter to Geoffrey Howson in 1983, he confesses: "The

Bjarnadóttir, K., Furinghetti, F., Karp, A., Prytz, J., Schubring, G., Weiss, Y., & Zender, J. (Eds.) (2023). *"Dig where you stand" 7. Proceedings of the seventh International Conference on the History of Mathematics Education.* Münster: WTM-Verlag.

> greatest mistake I ever made in mathematics education was my decision not to attend the Royaumont seminar in 1958 [sic!]" (it was at this seminar that the "modern mathematics" movement was launched. in Europe). Freudenthal said that he had already participated in so many "nonsense" meetings and assumed that this would be yet another one in this series. When he realised that at this meeting the "nonsense" had been taken seriously even by some governments, it was too late to avoid the disaster (Neeleman 1991, p. 5).[1]

> This lore is dominating the literature until recent times, see for instance: This was enough for Freudenthal to refuse to go to Royaumont—a decision that he would come to regret in his later years (de Bock & Vanpaemel 2019, p. 75).

One even attributes Freudenthal a decisive dominant position in Dutch mathematics education. A Wikipedia-entry expresses this lore:

> In the 1970s, his single-handed intervention prevented the Netherlands from following the worldwide trend of "new math".[2]

This standard view has already been somewhat revised by Sacha la Bastide-van Gemert in her doctoral thesis of 2006 (published in English in 2015), showing a participation of Freudenthal in the preparation of the Royaumont Seminar, a fact not known before, given that lore.

Researching the Freudenthal *Nachlass* and connecting it with my OEEC research

Reading the thesis by la Bastide instigated me to search in Freudenthal's *Nachlass*, in the Haarlem State Archive, and to try to connect it with my earlier research about the Royaumont Seminar in the Archives of the OECD in Paris.

That research had shown that the preparation of the famous meeting was practically not re-constructible, since – as the archive staff had told me – the officials at that time saw no value in preserving that material – they thought that the books published as Proceedings would already contain all pertinent material. The fact that Freudenthal had for a certain time participated in the preparation gave hence a chance to better understand some aspects of the Seminar.

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[1] Com essas idéias sobre educação Matemática, não é de estranhar que Hans Freudenthal estivesse entre os primeiros críticos ao movimento da chamada "matemática moderna". Aliás, numa carta a Geoffrey Howson em 1983, ele confessa: "O maior erro que já fiz em educação matemática foi minha decisão de não participar do seminário de Royaumont em 1958" (foi neste seminário que o movimento da "matemática moderna" foi lançado na Europa). Freudenthal disse já ter participado em tantos congressos disparatados e achava que este seria simplesmente mais um. Quando se deu conta que neste congresso o "disparate" tinha sido levado a sério até por alguns governos, já era tarde para evitar o desastre.
His source is a paper by Howson in 1985 in the Dutch journal *Nieuwe Wiskrant*.

[2] https://en.wikipedia.org/wiki/Hans_Freudenthal

Given that the OEEC so far had no experience at all with matters of education, the first key question was: with whom did the group charged within OEEC to prepare that meeting: cooperate, by whom were they advised?

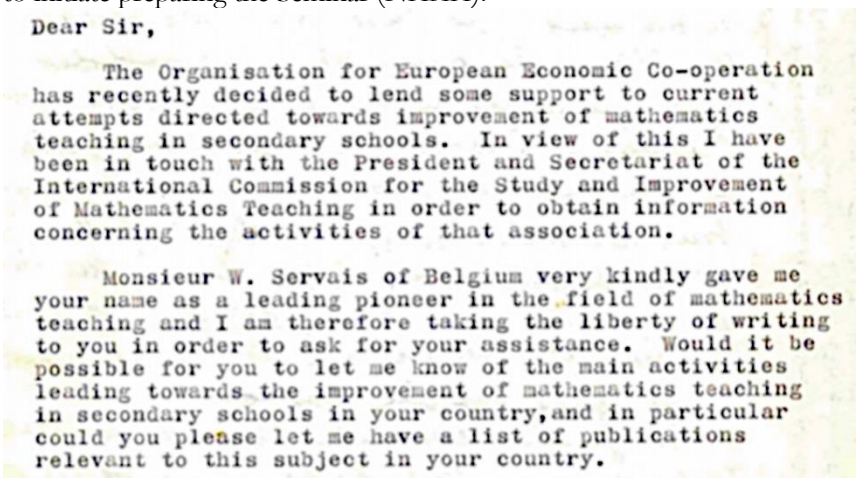
De Bock and Vanpaemel are rather postulating that it had been ICMI:

> it is beyond doubt that the International Commission on Mathematical Instruction (ICMI) was primarily responsible for the practical organization of the Seminar (de Bock & Vanpaemel 2019, p. 74)

In his autobiography, Freudenthal told how he became active in and for ICMI, without connecting this to a planning for the Seminar:

> I climbed one rung on the ICMI ladder every four years: 1958 Member at large, 1962 Executive Committee member, 1966 President, 1970 "Former President", 1974 ICMI Representative on the ICSU Committee on Science Teaching. It may sound immodest: to date I have been the only ICMI president, with heart and mind for math in school (Freudenthal 1987, p. 348).[3]

In all the following enumeration of his ICMI-related activities, there is no mention of the Royaumont Seminar. Actually, however, the very first letter by which Freudenthal became involved in the preparation, proves that the CIEAEM had exerted the first such consultative function. This is shown by the invitation, sent to him on October, 20, 1958 by J. Ron Gass, the head of OSTP, (Office for Science and Technology Personnel) the group formed by OEEC to lead with the entirely new area of their activities, so far restricted to economy. The letter, only shortly mentioned by la Bastide-van Gemert, gives clear clues about whom proposed Freudenthal to participate and which were the first contacts established by OSTP to initiate preparing the Seminar (NHAH):



Dear Sir,

The Organisation for European Economic Co-operation has recently decided to lend some support to current attempts directed towards improvement of mathematics teaching in secondary schools. In view of this I have been in touch with the President and Secretariat of the International Commission for the Study and Improvement of Mathematics Teaching in order to obtain information concerning the activities of that association.

Monsieur W. Servais of Belgium very kindly gave me your name as a leading pioneer in the field of mathematics teaching and I am therefore taking the liberty of writing to you in order to ask for your assistance. Would it be possible for you to let me know of the main activities leading towards the improvement of mathematics teaching in secondary schools in your country, and in particular could you please let me have a list of publications relevant to this subject in your country.

[3] Ik klom om de vier jaar een trede op de ICMI-ladder: 1958 Member at large, 1962 lid van he Executieve Comitee, 196 president, 1970 'oud-president', 1974 ICMI vertegen woordiger in het ICSU Committee on Science Teaching. Het klinkt misschien onbescheiden: tot op heden ben ik de enige ICMI-president geweest, met hart en hoofd voor wiskunde op school.

Thus, it was the CIEAEM[4] –, in English: *International Commission for the Study and Improvement of Mathematics Teaching*, the most active international group since the early 1950s active for reforms of mathematics teaching, and a type of NGO[5] -, with which the OEEC group had first established contacts, probably due to representatives of the group being active in France, and that the OEEC office was in Paris. I should emphasise that this first letter was not yet the invitation to the Seminar. It was an exploring activity, apparently aiming to get ideas of the state of already existing reform activities in Western European countries. Analogous inquiries will have been made with experts in other countries (or by consulting Willy Servais and other members of this group), but there are no traces of this preparatory stage in the OECD archives. Willy Servais exerted an important role in preparing the Seminar and in its realisation.

As a matter of fact, Freudenthal's answer was quite reserved, telling: "It is not possible to give a brief account of the activities for improving mathematical teaching in the Netherlands"; although being himself already quite involved in these activities, he named instead only a few groups and persons involved in reform activities – highlighting the Dutch national subcommission of ICMI, and the journal *Euclides*. And he mentioned himself as the president of two pertinent working groups, especially of the Dutch ICMI subcommission. Gass answered on November, 3, thanking very much and announcing further contacts, still not mentioning the Seminar.

The results of parallel inquiries have been synthesised by the OSTP staff already shortly after, in a 10-pages document of November, 11. The document is not preserved in the OECD archives, but it was sent to Freudenthal at the end of January, together with the invitation to serve as an expert – and Freudenthal drafted his answer on the last page of the document. This document proves a very careful reflection of actions of OEEC intervening in an already active field.

Stating an "increasing general demand for scientists and engineers and also "a demand for more mathematicians with new kinds of skills", it was argued that "all these new demands are obstructed […] by the uninspired teaching of mathematics", turning young people away studying these courses. The document was aware of new developments in mathematics education: besides "modern developments in mathematical knowledge and new pedagogical ideas stemming from psychological studies of the learning process […] having their effect on the substance and methods of the classroom teaching" – thus not restricted to proposing reforms of contents, but also of methods! (NHAH)

The document declared to be conscious not to "embarking on a virgin field of action", but that the field being characterised – besides some official organisations active – as "dispersed action by individuals and associations, without systematic

[4] In the book de Bock & Vanpaemel 2019, the CIEAEM is mentioned only as participating at the Seminar.

[5] Non-Governmental Organisation.

study and application of findings".[6] As organisations active on an international level, the document quoted the ICMI and the CIEAEM, and emphasised close cooperation with such professional and other international bodies. The Document proposed 3 major projects (NHAH):

5. On the basis of these conclusions, three O.E.E.C. activities are suggested:

(i) A survey of "Current Practices and Trends in School Mathematics";

(ii) A Seminar on "New Thinking in School Mathematics and Possibilities of Implementation";

(iii) A Critical Review of "Psychological Research bearing on the Problems of School Mathematics".

The survey (item 1) was prepared somewhat parallel to, and not as planned to be achieved before the Seminar. The psychological study (item 3) became included in the Seminar project – this was the study I had detected and published upon in my 2014 paper on "The Road not taken …". The main axes of the Seminar Programme were presented here already: (NHAH)

some progress has been made with the survey. The following are the main sections into which the papers and discussions would fall:-

(i) New trends in mathematics teaching (including papers on major experiments and research projects);

(ii) Problems of implementation (retraining of teachers, availability of textbooks and teaching materials, incorporation of the new thinking into teacher-training courses etc.);

(iii) The teacher's viewpoint;

(iv) The possibilities of follow-up action, both nationally and internationally (including future O.E.E.C. action).

The document shows a structure quite similar to the final structure, and a strong emphasis upon teachers and with concern upon methods. It took some time within the OEEC for deciding about these three projects; the first general discussion occurred early in December.

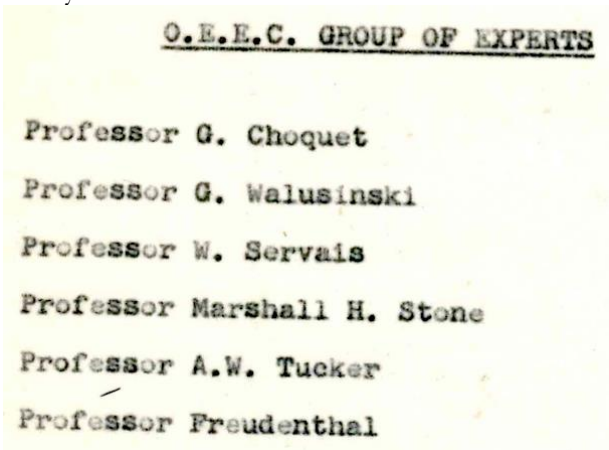
Freudenthal in the expert group

The next direct contact with OEEC was a two-pages letter by Gass, of 28th January 1959, inviting Freudenthal to participate in preparing the Royaumont Seminar and that survey, as a member of the group of experts. In particular, the letter invited to the first meeting of the experts on March 13 and 14 in Paris (NHAH):

[6] This characterization is almost identical with the assessment of the state of research into mathematics education as presented in the report by the NFER for the Seminar (see Schubring 2014, p. 166). Thus, cooperation by the OSTP staff with the British researchers had already been established then.

> Dear Sir,
> The Council of the Organisation for European Economic Cooperation has recently agreed a programme of activities, the purpose of which is to improve the output and utilisation of scientists, engineers and mathematicians in the O.E.E.C. countries. […] the Governing Committee for Scientific and Technical Personnel, which is the body directly responsible for the Council's work in this field, decided that major emphasis in this programme of action should be placed on the teaching of science and mathematics at the secondary school level. Following discussions with leading authorities in the field of mathematics teaching, the Governing Committee has adopted several projects along the lines outlined in the attached document.
> The Secretary General of the O.E.E.C. is most anxious to that any O.E.E.C. activities in the field of mathematics teaching should reinforce and support the effort of organisations already active in this field. It has therefore been decided that the O.E.E.C. Programme of action […] should be carried out with the advice and guidance of a small group of leading people in this field, representing professional mathematicians and those with administrative and teaching responsibilities for secondary school education in this field. The reason for this letter is that the Secretary-General wishes to enquire whether you would be willing to serve, in a personal and individual capacity, as a member of this Group of Experts.

As "immediate tasks" for the Group of Experts, the letter named to prepare the survey and the Seminar. The document showed the list of then invited experts:



O.E.E.C. GROUP OF EXPERTS

Professor G. Choquet

Professor G. Walusinski

Professor W. Servais

Professor Marshall H. Stone

Professor A.W. Tucker

Professor Freudenthal

This group consisted, hence, of four mathematicians active for mathematics teaching and of one mathematics teacher (the French Gilbert Walusinski). Albert W. Tucker was a specialist for applied mathematics (NHAH).

There was an immediate – and unusual - effect of this letter: Gass and Freudenthal met personally a few days later in Utrecht – a fact not revealed or commented by la Bastide! Appatently, Freudenthal felt both interested and somewhat preoccupied so that he contacted the Dutch Ministry of Foreign Affairs - for me, a quite strange reaction to this invitation! -, and that led to organise this direct meeting, Gass

travelling to Utrecht, probably on February 10th, only one week after Freudenthal's reaction:

Dear Mr. Gass,

Your letter of January 28th has raised a good many problems, which I hope to discuss with you in Utrecht on February 10th, according to a talk I had with Mr. Bruin of the Ministery of Foreign Affairs. I am glad to have this opportunity to meet you. In any case I hope to attend the meeting on March 13th-14th in Paris. I would highly appreciate to get a definitive notice convening the meeting as soon as possible.

Please note our new address.

Sincerely yours,

Gass sent the following day, on February 11, a letter from Paris, expressing his gratitude for the personal meeting and revealing that Freudenthal had discussed various preoccupations, which are not mentioned, however (NHAH):

OSTP/59/1957
646.1/JRG/EVH 11th February, 1959.

Dear Professor Freudenthal,

It was a great pleasure to meet you in Utrecht, and I was particularly pleased that you will be able to attend our meeting in Paris on March 13th and 14th. My colleague, Mr. Metzger, who is acting as Secretary of this small informal Group of Experts, will be getting in touch with you concerning the practical arrangements.

I hope very much that our collaboration will be fruitful and that we will be able to overcome the very natural scepticism which you may feel concerning the outcome of these activities.

Yours sincerely,

J.R. Gass
Head of Programming Section

Prof. Dr. Freudenthal,
Mathematisch Institut der Rijksuniversiteit te Utrecht,
Boothstraat 17,

Somewhat parallel to this direct communication, the office sent on February 5th a new document, which should have reached Freudenthal before his meeting with Gass: It was a slightly revised version of the November 11th document, now agreed by the OEEC bodies. One of its changes was that the earlier three proposed activities were now reduced to two:

A survey of "Current Practices and Trends in School Mathematics", and

A Seminar on "New Thinking in School Mathematics and Possibilities of Implementation".

On February 25th followed a formal invitation for the first experts' meeting in Paris, informing also about the payment of the travel expenses. And on March 3rd, the OSTP sent to the advisory group an "Introductory Statement", about the two

projected activities, and a "Draft Agenda" for the meeting on 13 and 14 March (NHAH):

Draft Agenda

I. OPENING REMARKS BY THE DIRECTOR

II. OBJECTIVES OF O.S.T.P. ACTIVITIES IN THE FIELD OF MATHEMATICS TEACHING AND TASKS OF THE ADVISORY GROUP OF EXPERTS

Introductory statement by the Secretariat OSTP/TM(59)2
/Reference STP/GC(59)67

III. DRAFT OUTLINE OF THE SURVEY OF "CURRENT PRACTICES AND TRENDS IN SCHOOL MATHEMATICS" OSTP/TM(59)3

IV. METHODS OF IMPLEMENTATION OF THE SURVEY

(Co-operation with international professional bodies etc.)

V. SEMINAR ON "NEW THINKING IN SCHOOL MATHEMATICS AND POSSIBILITIES OF IMPLEMENTATION"

General outlines of scope, methods, participants, lecturers

There is so far no information available about the discussions and results of the meeting. But there is a first critical letter thereafter, of 25 March, which Freudenthal wrote to R. C. Kwantes, of the Dutch Ministry of Education, who happened to be the Dutch member of the "Governing Committee" of OEEC, thus just the highest body of the organisation. Kwantes had asked Freudenthal shortly before about his opinion regarding a course on Mathematics, programming and introduction into mechanics of electronic computing in Western Germany supported by the OEEC. Freudenthal used this occasion to give already a highly critical assessment of the Paris meeting. From here on, la Bastide presents the events more detailed. But her presentation presupposes implicitly that Freudenthal was correct in criticising the Seminar conception.

Actually, right from the beginning, Freudenthal rejected that an international organisation should interfere into what Freudenthal judged to be of the competence of researchers dedicated to mathematics education. Even in 1987, in his autobiography, Freudenthal rejected what he judged as an intrusion of an agency, dealing with scientific and technical staff, into education:

> What did the OEEC have to do with education? It was the Bureau for Scientific and Technical Personnel responsible for the issue on new mathematics education (NHAH).

Surely, an international organisation aiming at developing economy – or, more exactly, aiming to maintain the Western economy to be hegemonic, regarding the block of socialist countries – launching now an initiative for concerted action of national governments for reforming the teaching of a definite school subject constituted a profound novelty. Yet, the logic of this intrusion was quite evident when being conscient of the Sputnik shock: For its major aim, the quality of the training of technicians and engineers, but also of scientists proved to be crucial and could no longer be left to scattered initiatives by individuals or groups like

associations. It is remarkable that Freudenthal never mentioned the Sputnik shock and its aftermath for giving major governmental attention to education and training in the Western block.

Freudenthal had used his answer, of March 25, to Kwantes, the Dutch member of the OEEC Governing Committee, to criticise exactly this Governing Committee for allegedly having already decided all about the Seminar:

> We could not introduce essential changes in the plan put before us since the Governing Committee had already approved it (la Bastide 2015 [transl.], p. 214).

Freudenthal had attacked, after the Paris meeting, essentially only one of the two projects: the survey of the situation of math teaching in the various countries.

Freudenthal told in his autobiography a detail from his meeting early in February with Gass, revealing that he was strictly separating contents from methods:

> I tried to talk to the OECD representative who came to see me: not 'Enseignement des mathématiques modernes' but 'Enseignement moderne des mathématiques' as the title of one of my essays reads. To no avail: the OECD teamed up with leading mathematicians with no connection to mathematics education (Freudenthal 1987, p. 350).[7]

In fact, dichotomising contents and methods is the conception upon which he bases himself recurrently to criticise the Seminar's preparations. When the OSTP sent, on April 16th, a detailed plan for the Seminar, practically as a result of the Paris meeting, Freudenthal attacked sharply this plan for the Seminar programme, now focussing upon the alleged missing focus on methods. In the accompanying letter, by Helmut Metzger, it was emphasised as an "outline", and as "a first draft", Freudenthal attacked it as showing that already all had been decided– first in his answer to Metzger, and later in reclamations with another Dutch representative at OEEC.

Actually, he had stressed in his criticism of March of the survey project, that "since time immemorial the ICMI produced the kinds of reports as envisioned by the OEEC and these never had any positive influence whatsoever" (la Bastide, p. 214), thus not understanding the qualitative difference between the unsystematic character of the earlier reports by some individuals and the now envisaged Government-organised reports. Now, however, he switched to claim that all the aims of the OEEC Seminar would have to focus upon methods, instead allegedly upon contents – and that such a focus would entail year-long research by specialists. He uttered this, for instance, in his answer to Metzger's draft material for the Seminar (NHAH):

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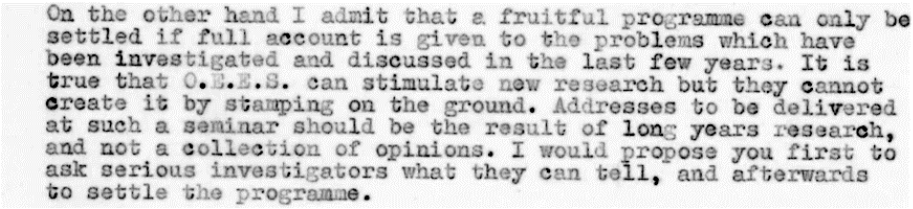
[7] Wat had de OESO met onderwijs te maken? Het was het Bureau voor wetenschappelijk en technisch personeel waaronder de vraag naar nieuw wiskunde-onderwijs ressorteerde. Ik trachtte de OESO-vertegenwoordiger die me kwam opzoeken om te praten: niet 'Enseignement des mathématiques modernes' maar 'Enseignement moderne des mathématiques' zoals de titel van een van mijn opstellen luidt. Het mocht niet baten: de OESO ging in zee met vooraanstaande wiskundigen zonder enige relatie met het wiskunde-onderwijs.


On the other hand I admit that a fruitful programme can only be settled if full account is given to the problems which have been investigated and discussed in the last few years. It is true that O.E.E.S. can stimulate new research but they cannot create it by stamping on the ground. Addresses to be delivered at such a seminar should be the result of long years research, and not a collection of opinions. I would propose you first to ask serious investigators what they can tell, and afterwards to settle the programme.

Clearly, awaiting year-long research was contrary to the need felt by Western governments that one had to initiate changes in order not to lag behind.

Freudenthal had told the Dutch officer, with whom he had sought contact, in that letter of March 25th, that he was not the only expert who had criticised the procedure practiced by OEEC. On the other hand, it is quite telling that the second meeting of the advisory group, planned for May 23rd, was cancelled by Gass as a reaction to what Freudenthal had written to Metzger's draft material. Gass told Freudenthal that the second meeting was no more necessary, due to the opinion transmitted by him. This suggests that it had been only Freudenthal himself who had urged for this second meeting and since it was being only him, the meeting was cancelled. Marshall Stone, being then at the same time the president of ICMI, continued preparing concretely the Seminar.

In his letter to Metzger of April 21st, Freudenthal accused OEEC to act as if mathematics education would be a "tabula rasa" – while the OSTP and OEEC had always emphasised that they are not encountering a "virgin field" and that they are thus seeking necessarily the cooperation of all active in this field.

Regarding the complaint that all had already be decided, the draft programme of April needed to be more concrete, given the projected date of the Seminar approaching. Thus, it drafted already a thematic structure for the days of the meeting. The proposed papers featured, yes, changes in contents, like this selection from "Summary of the objectives", shows:

1. Clarify and sharpen the need for reform in Mathematics education.
2. Bring to the fore the frontier thinking in mathematics.
3. Bring to the fore the needed change in content and concepts in the school curriculum.

- besides concern for teaching issues:

5. To restate the purpose and goals in the study of school mathematics or pupils of different abilities.
6. To re-examine Teacher Education and retraining of in-service teachers.
8. To propose research in mathematics education to answer unsolved problems (NHAH).

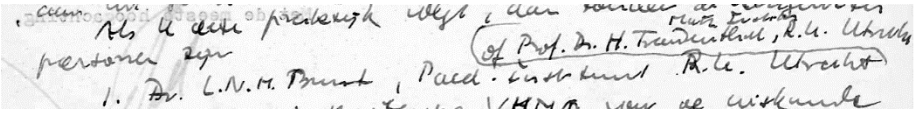
Moreover, the numerous preparatory papers elaborated before the meeting show an intimate connection between contents and methods of teaching – for instance a paper by Zoltan Dienes (see Schubring 2014).

Regarding the Seminar itself, it is also part of the lore that Freudenthal had refused to participate. Actually, and as he himself told in his autobiography, he had preferred not to nominate himself when the Dutch Ministry asked him on July 14th to make proposals for the three Dutch delegates. He commented his answer with

this explanation, which became part of the lore: "I didn't let myself be delegated to it because I was fed up with this kind of conferences" (Freudenthal 1987, p. 350).[8]

Verifying whom he had proposed, reveals a major surprise, however, disclaiming his proper affirmations. In his handwritten draft, the list applied the three categories of prospective participants as indicated by OEEC: first a university mathematician – "1. Dr. L.N.H. Bunt, Paed. Instituut, R[ijks]U[niversiteit] Utrecht". Then a representative of educational administration – here Freudenthal proposed one of the inspectors of VHMO (Preparatory Higher and Secondary Education), without giving a name. And he named two mathematics teachers: "3. Dr. J.H. Wansink, van Wimecos, of Dr. P. J. Vredenduin, van Liwenagel".[9] But, probably after some reflection, Freudenthal named himself, proposing him as an alternative university delegate:

"of Prof. Dr. H. Freudenthal, Math Instituut [?], R.U. Utrecht" (NHAH)



Given his strong criticism of the Seminar project, repeated in the same letter, the Ministry did not nominate him. Since Bunt was already invited as a guest speaker, Henri Leeman was called to represent university mathematicians and Vredenduin for the mathematics teachers. Moreover, it is clear, given his criticism, that Freudenthal was also not invited by the OEEC to act as one of the invited speakers. Freudenthal might later have suppressed that the Ministry had not followed his proper suggestion to nominate him?

A tentative summary

Assessing now Freudenthal's role in the preparation of the Royaumont Seminar, one has to state several rather strange handlings.

Already his first reaction to the invitation, of October 1958, to participate in the projected survey study was a flat rejection of any cooperation. Upon reception, in January of 1959, of the invitation to participate in a government-linked international activity, Freudenthal's very unusual reaction was to pressure the Dutch Foreign Ministry, so that the responsible at the OEEC had to render himself immediately to Utrecht – for justifying the projected activity.

Later, Freudenthal pressured Dutch members in the OEEC Governing Committee to act for suspending the prepared projects. And when these projects were confirmed, despite his objections, he alleged:

- OEEC wishes to create math education by stamping on the ground – contrary to the clear consciousness and spirit of cooperation of the OECD team;
- other experts agreed with his criticism, without naming any such expert.

[8] Ik liet me er niet nartoe delegeren omdat ik schoon genoeg had van dit soort conferenties.
[9] The Dutch word "of" means "or" in English.

Moreover, he alleged to follow a conception of mathematics education where methods should be the focus and where methods should be conceived as separated from contents.

Freudenthal even argued that years-long research into mathematics education should be the priority, before undertaking any curricular reform in school mathematics.

One remarks in the steps taken in preparing the Seminar, that when Freudenthal's criticism had become insuperable, the second meeting of the experts' group was declared to be unnecessary, which is strong evidence that Freudenthal was the only opposing expert.

One wonders therefore whether Freudenthal seriously did prefer "quiet" research into mathematics education, undisturbed by political agendas?

As one remarks in the Seminar's agenda, as proposed in the document of April 16th, after the meeting of the experts group, research in mathematics education – Freudenthal's panacea as necessary keystone -, was integrated among the eight objectives.

And, contrary to the lore which he himself constructed later on, Freudenthal not only participated in the preparation of the Seminar and had exerted a certain influence on it, he even had wished to be nominated as one of the Dutch delegates.

Epilogues

A. Two Competitive Geometry Programmes

As issue of a first epilogue, I should like to mention just one point about the reality of the Seminar, which will be related to the second epilogue. In the Seminar's worldwide reception, there appears always as its main message the plea by Dieudonné: *Euclid must go*! The Seminar's conception had been, however, to confront *two* experts regarding geometry teaching: Dieudonné and Otto Botsch, who was the invited speaker from Western Germany, director of the Helmholtz Gymnasium in Heidelberg.

The preliminary (internal) Report of the Seminar presented the confrontation of the two invited speakers as a confrontation between Dieudonné and Botsch - with Botsch, however, already in a minor position: being quoted even without giving his name:. The report about the part III Geometry presented first Dieudonné's talk and its discussion:

> Professor Dieudonné presented in outline form a programme in geometry, based entirely on vectors and a vector space of three dimensions. This programme would eliminate Euclidean geometry as we know it. The details of such a programme for secondary school mathematics would be a matter for future experimentation and writing. The consensus of the seminar was that this approach is too radical for immediate introduction, but that the traditional treatment of Euclidean geometry must be greatly modified and gradually the high school geometry must be reformed into one that is more algebraic, especially leading to vector treatment.

After resuming more this discussion, featuring the replacement of triangles and congruence properties by isometric transformations, the next paragraph presents Botsch's contribution and its discussion – without giving the name of this invited speaker:

> A detailed programme, based on Felix Klein's Erlanger programme of invariants in groups of transformations, and called Bewegungs (action) geometry was presented. This programme calls for the study of physical geometry at an early age leading to intuitive ideas of shearing, stretching and rotating, by using physical models (a dynamic approach). Later, paper folding. Mirrors, and drawings give the first ideas of transformation. Then a semi-formal study, by geometric construction of reflections, rotations, and translations leads to the preservation of metric properties under such transformation (OECD).

The report continued with one more paragraph resuming Botsch's talk, but gives no information about its discussion.

In the published Report, edited by Howard Fehr and Luke Bunt, a Dutch colleague of Freudenthal, of its two chapters about "Reforms", the first highlights Dieudonné's presentation, identifying it even with the aims of the seminar - by giving it the same title "New Thinking". Botsch's presentation, by contrast, is presented without any highlighting in the "continued" chapter, like being some additional material (OEEC 1961).

Part I

REPORT ON THE ROYAUMONT SEMINAR

B. Modern or New Math: a failure?

One more issue for an epilogue concerns one point of the Seminar's **aftermath**. It constitutes also a key conviction of the lore, that "new math" or "modern math" was a general failure; this failure uses to be evidenced by the, later criticised, substitution of teaching geometry by linear algebra, and the exaggerations of teaching set theory in primary grades as blind manipulations of symbols. Freudenthal has echoed this:

> New Math, legalised in Royaumont, left its destructive trail through mathematics education worldwide. In Royaumont, underestimated by me, New Math's worldwide triumphal march began, which would culminate in an ignominious defeat. Only The Netherlands was somewhat spared (Freudenthal 1987, p. 350).[10]

[10] New Math, in Royaumont gelegaliseerd, trok zijn verwoestend spoor wereldwijd door het wiskunde-onderwijs. In Royaumont, door mij onderschat, begon de wereldwijde

There was no such failure, which is often overlooked! The former clear hierarchy between practical arithmetic in primary grades and mathematics in secondary schools has been abolished as one decisive effect. Both school types are since then understood to teach a coherent body of school mathematics. For instance, the decision of the West-German *KultusMinisterKonferenz* in 1976 to revise its decision of 1968, to introduce modern math in primary and secondary schools has been interpreted as renouncing to the 1968 programme. This is, however, completely wrong – it was not a return to the basics (Griesel 1977).

C. The West-German participants

Like in The Netherlands, there have been only two delegates, and one invited speaker. The two participants were:

- Richard Schöne, from the Ministry of Education of one of the Federal States, of Rheinland-Pfalz, and
- Hermann Athen (1911-1981), director of the Bismarck-Gymnasium in Elmshorn and a schoolbook author, active in promoting modern mathematics.

The invited speaker was Otto Botsch (1905-1990), director of the Helmholtz-Gymnasium Heidelberg, invited for his contribution on geometry teaching, according to Felix Klein's *Erlanger Programm*. Due to the largely missing documents of OEEC preparing the Seminar, it is unknown how he became invited. This is an open question, since all his publications seem to be just in German.

I set out to search for their *Nachlass*, aiming to find material of their participation at the Seminar, and in particular more about the preparations. Unfortunately, the results of the search so far are very meagre. Even there where one should be sure to find material, in the Ministry of Rheinland-Pfalz. No files at all are preserved about Schöne! Regarding Athen, search of the members of his family proved to be unsuccessful so far.

The only relative success was achieved with Botsch. Thanks to having been the director of the Helmholtz-Gymnasium, the school has preserved a part of his *Nachlass* in its library; Joerg Zender has begun to search this source.

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zegetocht van New Math, die o penn smadelijke nederlag zou uitlopen. Alleen Nederland blef enigszins gespaard.

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