

Report from the Advisory Committee  
of  
the Solvay Institutes

2018

## Executive Summary

We will this time not discuss much the existing activities which all work very well.

We like to emphasise the following points.

- The Solvay Institutes make the ULB and VLB leading universities in Europe in natural sciences as compared to corresponding universities in Europe.
- The Solvay Institutes are run in a most impressive, efficient and competent way.
- Within the existing organisation and budget we find that the activities have reached an optimal stationary level.
- The Solvay institutes have now reached a balance between the activities in physics and chemistry.
- The Solvay Conferences are the pearls in the activities. Every effort should be spent to uphold this level. We support the planning of a conference in biology/life sciences in 2021.
- The Solvay Workshops, The Solvay Chairs and the Solvay Colloquia are activities of highest rank and quality. They have been established as key activities to further Belgian science and play a huge role both nationally and internationally.
- The creation of the New Horizons Lectures in physics and in chemistry for young scientists has started out very well and the programme for the future years is quite impressive.
- The Solvay Public Lectures are of utmost importance to foster interest in the most modern, fundamental science within the public mind. It is very impressive to gather some 800 people on a Sunday afternoon.
- The efforts to bring in the young scientist in the planning and attendance of the colloquia have been successful and should be continued.
- The strong and steady support from the Solvay family and the Solvay group provides the basis for the institutes and the committee appreciates a lot the introduction of the sixth generation to the activities.
- The strong support from the two universities both economically and morally is also very important for the institutes.
- The establishment of national committees including all the relevant Belgian universities to discuss and propose the programmes has been very successful and is establishing the Solvay institutes also as national institutes.
- The Solvay Institutes build an important bridge between the two language groups in Belgium.
- A substantial increase in the endowment is necessary if the institutes will branch out into biology/life sciences.
- The discussion about the future successor as director should investigate both possible persons suitable for the position as well as possible constructions for the position.
- The Institutes should interact with the two universities if they contemplate to introduce new research directions. This could be done by organising workshop or lectures in such fields.

Also this time we like to emphasise that it is very rewarding for the Committee to see our recommendations in the past being so seriously considered.

## Introduction

The Committee that consists of Prof:s Lars Brink (Göteborg), chair, Leticia Cugliandolo (Paris), Karen Goldberg (Philadelphia), Gunnar von Heijne (Stockholm), Hermann Nicolai (Potsdam), Bert Meijer (Eindhoven), Hiroshi Ooguri (Pasadena and Tokyo) and Jacques Prost (Paris) met in Brussels on November 26-28. Unfortunately Prof. Hermann Nicolai (Potsdam) could not attend the meeting due to illness. In order to prepare ourselves we had obtained a report on the activities in 2017 as well as various informations about the institutes. We have also had the report from 2015 as a reference for the work.

On November 28 the Committee met with the Director and the Deputy Directors, Prof:s Marc Henneaux, Alexander Sevrin and Lode Wyns together with the President of the Board of Directors Jean-Marie Solvay and Prof Paul Geerlings from the executive group for an informal dinner. On November 29 the Committee had discussions with Prof:s Henneaux, Sevrin, Glenn Barnich and Irina Veretennicoff and a meeting with Prof Jan Danckaert, Vice rector VUB, Prof. Gino Baron VUB representative on the Board of Directors, Lode Wyns, Paul Geerlings and Alex Sevrin together with Jean-Marie Solvay. Then followed a lunch together with Prof Koen Debackere (KUL Professor and KUL General Manager). In the afternoon the committee met with Jean-Marie Solvay, Marina Solvay and three members of the sixth generation of the Solvay family, Diane Thibaut de Maisires, Valériane Moyersoen and Daisy-Anne de Selliers de Moranville . After that we had a long discussion with Baron Daniel Janssen together with Jean-Marie Solvay. Much of the day was devoted to discussions about the future.

. On November 30 the Committee met with the scientists engaged in the institutes, Prof:s Yves Geerts, Anne De Wit, Ben Craps, Pierre Gaspard and Lode Wyns. The committee also had a brief interview with the secretariat, Dominique Bogaerts and Isabelle Van Geet. This was followed by a lunch meeting with Prof Yvon Englert, the ULB Rector and Prof Oberdan Leo, the ULB vice-Rector for research and Eric De Keuleneer, former director of Générale de Banque and ULB representative on the Board of Directors of the Solvay institutes together with Jean-Marie Solvay. Between and after the interviews and at the dinners the Committee had its deliberations.

The Committee found that all interviewees were very enthusiastic about the Solvay Institutes like at previous times. They are all committed to the cause to run the various activities and to uphold the excellence stamp that the name Solvay carries. Everyone was very content with the progress during the last three years when the activities in chemistry has reached the level of the one of physics and the Belgian universities outside Brussels have been engaged in a very meaningful way. Apart from the secretariat, the work behind the activities is performed on a voluntary basis within the academic positions. The Committee very much appreciates that the two universities allow and support this. It puts, however, a limit as to how much work the staff can do for the Solvay Institutes. We will comment more on this fact later.

The Committee appreciates that the recommendations from previous reports have been given such strong considerations and are very happy to see how well they have been implemented.

## Scientific Activities

The Committee is again very pleased to see how well all activities are working. They are all of highest rank and quality. The organisation behind, which is partly based on a voluntary basis, is done with great enthusiasm. We can only congratulate the Institutes for these achievements. The creation of the New Horizons Lectures in physics and in chemistry for young scientists has started out very well and the programme for the future years is quite impressive. Also the initiative to involve the younger scientists in the colloquia seems to work very well and we urge the Institutes to follow up and gauge the progress. We strongly believe that the broadening of the horizons that the colloquia can give is ever more important for all scientists especially the younger ones, but that story has to be told over and over again.

The Committee finds that the activities of the Institutes are at an optimal level given the economic and personal resources. We understand that there might be more proposals than there is room for activities. This will only make the programmes better, but they have to be balanced such that people do not get too upset if they cannot organise the activity they have intended to do.

We understand like last time that it could be difficult to get someone for a Solvay chair be present in Brussels for the whole month. Even so the chairs have been filled with world-class scientists and the programme is very successful. We find it advantageous like last time that she/he also extends the activity to visit and make contacts with other universities in the country, This visit program seems to be working well.

## **Gender Balance**

The committee highly appreciates the continued efforts by the institutes to improve the gender balance. The progress - especially in chemistry - is seen as first steps and the committee strongly recommends to make gender balance an important topic for all activities. It should not be done by introducing quotas but by making sure that the programme committees always try to invite female speakers and participants if there is a choice between equally important persons on an invitation list. As long as the programme committees also have an imbalance they have to make extra efforts to improve that imbalance among invitees. The Director and the executive group have the overall responsibility to make sure that the imbalance among the programme committees and the invitees is continuously improved.

## **Staff and Support for the Director and plans for the future**

Like at the previous times the Committee has understood that the success of the Solvay Institutes rests heavily on the tireless and excellent work that the Director and the staff perform. The appreciation for them is remarkable from all persons interviewed and very well deserved. Also the enthusiasm of the other persons involved is necessary for the success. The role of the director is very demanding. It is then very important that he is not burdened with some of the very time-consuming chores ordinary university professors have to deal with such as massive applications to secure research funds. This is now taken care of by support from the Solvay family which we find very considerate and appropriate. However, it would be advantageous for the future if such funds could be part of the chair. That would facilitate the future appointment of a new director.

The two deputy directors play a vital role for the success of all the activities. We will especially note this time the work of Lode Wyns during the last three years who together with his colleagues from the executive group have managed to bring the chemistry activities up to the level of the physics one. We understand that he wants to scale down his activities. We sincerely hope that a suitable successor be found. These positions are keys to a successful organisation and every effort should be made to have the right people for them. We are also very impressed with the devotion of the assistants to the director. We like to introduce the name members of the executive group for them. Let us especially commend Anne De Wit who has served in the organisation for quite some time now and who showed a particular maturity to all the issues we discussed with her. Like in previous years we can only command the secretariat with Dominique Bogaerts and Isabelle Van Geet, which is extremely efficient, knowledgeable and professional. Like in so many of the positions discussed here the specific persons play a vital role and if anyone will leave every effort has to be made to secure a replacement of the same calibre.

Marc Henneaux' present term as director ends in 2021. We have understood that he is willing to continue for another six-year period. It is vital for the institute that he can stay on as long as possible. We do not need to further stress his importance for the Institutes. He will be able to continue even when he in two years will start as Professor of Collège de France. Even if it might be nine years before a successor will be appointed it is time to ponder all the options. The committee

thinks that all doors should be open. It is true that the director moves in a very difficult landscape with the two language groups and needs to know this landscape, but she/he will also need to know how to direct Institutes in a university milieu and a Belgian society that is complex. Ideally one would find a successor within the faculties of ULB and VUB, but if that is not possible one has to look further towards the horizons. To prepare for this the Committee suggests that a particular chair is created which is shared by the two universities which can be in any of the fields that the Institutes are working in, and which has extra fundings such that the conditions of the present director can be upheld. Even though this is hopefully nine years away the work for creating such a chair should start in the near future.

## **Documentations**

A very important aspect of all the activities is the documentation on internet. We notice that the normal running of the web pages is performed very expertly by the staff. The web pages are very instructive and is continuously being upgraded with new material and new functions that streamline the activities. More and more of the archives are coming on line and it is very instructive. This was discussed in the last report and the progress is again quite good. The Committee has urged the secretariat to set up a Facebook page and a Twitter account to promote information about the activities. This has been done but has not drawn many followers. Perhaps this is a venue where younger members of the faculties could be asked to help. They are much more involved in the latest trends of the internet and could be very useful setting up the right channels for information. The committee suggests, however, that access to the social network accounts should be limited to the Director and the administrative staff and should not be shared by anybody else. Only the Director can speak on behalf of the Solvay Institutes, even over Facebook or twitter, and this responsibility should not be delegated to others.

We are very pleased to see the Solvay Science Projects being set up with material of utmost importance for the history of science. In some respects they are unique in the world containing correspondences between some of the most important figures in the history of science. The project is supplemented with lots of material about the individuals who have been engaged over the years. The project has been resting earlier to a large extent on Prof. Franklin Lambert, with very deep knowledge about the Institutes engaged in this matter. We are very pleased to learn about the involvement of both Marina Solvay and Jean-Marie Solvay in the project. We argued in the last report to open up the archives to some chosen graduate students of the history of science. They could do the bulk of the work while at the same time getting unique material for their theses. This has been started and a student in documentation has been hired. Here some strategic cooperations could be set up with University departments or institutes. This issue was not much discussed this time but every effort to make the historic developments available to interested persons should be considered. Also the lectures and discussions at the Solvay meetings but also of the deliberations to organise these meetings today are of course of utmost value. The Institutes should try to save these for a posteriori. We are very pleased to see that more and more material from the conferences and workshops such as proceedings and pictures are coming on line.

There is a modern trend that scientific documents of historic value are auctioned with a risk that they will disappear from the scholars. It is very important that the Institutes are aware that such things can happen and make every effort to safeguard documents of value..

## **Extensions into biology/ life sciences**

The physics conference in 2017 was in the subfield of biophysics. It gathered world experts in both biophysics but also in biology. It was a great success and the idea came up that the Solvay Institutes should have a third branch also in biology/life sciences, making the three-year cycle with conferences complete with one every year.

The committee finds this a very interesting proposal and appreciates the initiative by the Solvay family to fund such a conference in 2021. We believe that such a conference should be a check-point to see if such conferences could be as unique as the physics and chemistry ones. There are many more conferences and meetings in this broad field, but as far as we know no one of the same character as the Solvay conferences. It is very important that the first conference in a series is a success that will be remembered many years in the future, so special efforts should be made to find a topic that is deep and important enough. It must focus on fundamental scientific issues, not on more applied areas. There are two venues to follow. Either one invites the most famous and established scientists in the field or one tries to identify young stars that will be the famous ones in a near future. We would recommend the second one but of course with participations also of older generations. We would also recommend a smaller size than the standard size of about fifty participants. One key point is to find a chairman of the committee to organise the meeting. She/he should be at the same level as the chairs of the physics and chemistry committees. We would favour a smaller committee to start with and if the programme gets established to fill it up to a full size later. The chair and the initial committee should have full freedom to choose the subject, but they should know how the other two committees work. The Solvay Institutes might have to play a more active role in guiding the choice of the subject and the character of the invitees than they do for the other conferences.

After the meeting the conference has to be evaluated and checked that it is of the level as the ordinary ones, and if there is room for these conferences and if so to continue, and set up the full programme. However, an extension of the programmes can only be proposed if it is not interfering with the existing programmes.

## **Finances**

The Committee is very pleased to see that the Institutes can be run on the existing budget. For an outsider the existing funding seems to be low, but one has to keep in mind the support of the two universities and of the scientists involved in the programmes. Even so the committee is worried for the future. We understand that the support of the National Lottery which constitutes almost 20 % of the budget is not to be taken for granted in the future. There is always a temptation for such an organisation to seek to spend money on other, for the public, more visible events. There is also a risk that they will argue that they have supported the Institutes at a point of building them up, and that they like to seek other upstarts. We have understood that the contributions from the regions is now fairly stable so there does not seem to be any immediate threat to substantial cuts from other contributors. The contributions from the two universities are also stable and should probably be kept at the present level, in order not to be too dependent on the universities.

However, the weak point in the financing is the endowment. The present level is 6 M Euro, and it has increased steadily since the new start of the Institutes. It does now give a substantial part of the running costs and together with the generous support of the Solvay family and the Solvay Group it provides a steady source for the expenses. However, even if there are no extensions in the activities, the Institutes would benefit from having a larger endowment. It would provide a further stability and independence. We understand that much effort has been spent to find new donors and we appreciate the difficulty for institutes so intimately connected with the Solvay name and the Solvay group.

The introduction of a new programme in biology/life science might be a door opener to new donors. We would urge the Institutes to use the decision to launch the 2021 conference in this field to approach new possible donors. If such a programme should be permanent the Institutes need to increase the endowment by a sizeable amount. The introduction of a new programme will not only draw new costs for the conferences. There will be more administrative costs. Even though the secretariat told the committee that they believe that they can handle the extension, we believe that more administrative help will be needed to let the secretariat handle the important issues with the conferences. In the long run if such a programme gets established there will be a need also to

enlarge the existing activities into biology and to set up both local and national committees for that field. This will mean a substantial increase in the local costs to run the Institutes. It must be kept in mind though that in no way new initiatives should jeopardise the quality and size of the already existing activities.

## Conclusions

The Committee is very pleased to see that the excellent quality of all the programs has been upheld during the last three years and notes the great success of the two conferences that have been held since our last report. The task for the Director, Board and the Management is to continue along the same lines as in recent years.

The Committee is also very pleased to see that the imbalance between physics and chemistry and also about the weak participation of Belgian scientists and institutions outside the Brussels area is now being remedied. We find that the organisation works at an optimal level and have no concrete new proposals to put forward apart from the biology/life science initiative.

The Committee supports the idea to organise a Solvay conference in biology/life sciences in 2021 to see if the activities can be extended also to that field making the engagement in natural science more complete. This will by necessity demand a substantial increase in the budget, and a new programme can only be set up if the endowment is substantially increased.

The overall impression that the Committee has obtained also this time is that the Solvay Institutes are run in a most impressive and competent way. It is due to the excellent job of the director but also of his associates in the organisation. It is remarkable that the director and his staff have re-established the Institutes as world-leading institutions so swiftly, and the Committee can only congratulate Belgium and the scientific communities in physics and chemistry to have these activities.

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