“Reporting on Science Policy”

talk given by Prof. Dr. Dr.h.c. Urs Hochstrasser on December 3 2008 at the Conference on “Science and Foreign Policy”

Acknowledgements

First I would like to express my gratitude towards two outstanding gentlemen for their great support in surmounting the resistance against the addition of a scientist to the staff of the embassy in the American capital:

- my direct superior, Ambassador Henry de Torrenté (1893-1962),
- the then chief of our Foreign Ministry, Federal Councillor Max Petitpierre.

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The close relationship between the two, based on the outstanding services of my ambassador during his long diplomatic carreer, was essential for the impressive attention which quite a number of my reports got in Switzerland. Petitpierre circulated these documents among his colleagues in the Federal Council. This helped to make our government fully aware of the tremendous effort of the US federal authorities to develop basic and applied research as well as improving scientific education in their country as a consequence of the Sputnik Shock in 1957. The information which I collected on my annual visits of the Swiss academic institutions contributed to their realization that the arrears in the infrastructure and in the research of the science faculties of the Swiss universities which accumulated during World War 2 threatened even to increase and required special measures and heavy investments by the Confederation.

I am also very grateful to the many American scientists who received me with a magnificent alacrity to inform and help me. Only a few can be mentioned here:

Prof. Willard F. Libby then member of the US Atomic Energy Commission
Dr. Wallace Atwood, Director, Office of International Relations National Academy of Sciences
Dr. Franklin K. Pittman, Director, Div. of Reactor Development, US-Atomic Energy Commission
Dr. Robert Huntoon, Dep. Director, National Bureau of Standards
Dr. Hugh L. Dryden, Dep. Director, National Aeronautics & Space Administration
Dr. J. Wallace Joyce, Head, Office of Special International Programs, National Science Foundation
Especially I should recall the generous support by Dr. Wallace R. Brode, then Science Advisor, US State Department. When I left our embassy in 1961 to become Delegate of the Federal Council for Atomic Energy Matters in Berne he expressed his appreciation of my activities as science counselor in the following letter:

The Ambassador of Switzerland
2920 Cathedral Ave.
Washington, 8, DC.

My Dear Mr. Ambassador:
It is with considerable regret that Mrs. Brode and I must decline your kind invitation to say goodbye to Dr. Hochstrasser and to meet his successor, Dr. Steiner. My association with Dr. Hochstrasser has been most pleasant and extensive for prior to my going to the Department of State to serve as the Science Adviser to the Secretary of State, I was the Associate Director of the National Bureau of Standards when Dr. Hochstrasser was a guest worker in that institution. Dr. Hochstrasser has done a splendid job in developing the contact between the American Scientists and your scientists and I have found him one of the finest of the many foreign science attachés with whom it has been my privilege to work with.

Mrs Brode and I will be leaving on a lecture tour to the Pacific Coast on the 26th of April and the time limit is such that it will be difficult to change our schedule. If there would be any possibility I will most certainly try to attend but at the moment it does not seem likely. We appreciate your kind invitation and wish Dr. Hochstrasser and his successor the best of success in their new assignments.

Cordially,
Wallace R. Brode
Wallace R. Brode

Furthermore I thank all those who made this colloquy possible and succeeded in organizing such interesting program dealing not only with the past but also with the future role of the science counselors in Swiss diplomacy. I am very happy that thus they accepted my insistence on using this fiftieth anniversary to attract a wider attention to the remarkable development of this service essential in an increasingly science based world.

Before I start with my topic also a justification of its choice as the subject of my intervention may be in order:

Science policy that is the collective of measures to achieve certain predetermined objectives in cultivating science is just one in a long list of topics of interest to the scientific counselor. But since the sciences have become in many ways an essential part of our life I think that it should be given a clear priority in his activities. This motivates also my recommendation at the end of my talk.

1. My start at the Swiss embassy in Washington D.C.

When Monsieur de Torrenté greeted me on my first day at the embassy he told me that up to then he knew fairly well which were the tasks of his new collaborators since during his long and distinguished professional career he had fulfilled the same functions. In my case he lacked this experience. But later on with my support he familiarized himself especially with the problems of science policy to such an extent that he choose the topic “La recherche scientifique et ses conséquences économiques” for the lecture (published in Revue Economique et Sociale, 17 , Nr.4, Octobre 1959, p. 377 – 394) which he gave at the university of Geneva when he obtained there a Dr. h.c..
At the end of his welcome he asked me to propose a list of the problems which I wanted to tackle. He recommended consulting the scientific collaborators at those western embassies in the US-capital which possessed such a service already for some time. Following his advice and profiting of the great readiness of these specialists, all of whom had established themselves as estimated intermediaries between the US and their homeland, to inform me about their activities. I could assemble in a short time the following impressive list:

i. Popular reports about scientific questions with political and economic aspects, scientific and technical advice to the embassy and authorities in Switzerland.
ii. Reply to technical inquiries from Switzerland and the United States.
iii. Report on problems of recruiting and training technical and scientific specialists
iv. Establish good contacts to Swiss specialists in the US, Analysis of the "brain drain" and the possibilities of recovering emigrated Swiss specialists
v. Autonomous treatment of tasks assigned to the embassy, in particular in connection with the implementation of the Swiss- US 1956 agreement to cooperate in the field of the peaceful uses of nuclear energy.
vi. Advice to Swiss and American scientists planning to visit or work in the US respectively in Switzerland.
vii. Representing Swiss technical and scientific associations in important meetings in the US when it is not possible to send a delegation from Switzerland

My ambassador accepted this list as my “cahier de charge” and it was also approved by the Federal authorities in Berne. Implementing it kept me very busy during the two and a half years which I spent in the diplomatic service. It may be surprising that this list does not contain the term “science policy” although I devoted considerable time to establish and cultivate personal contacts to those

leading members and offices in the US administration who had important responsibilities in this field. I shall explain the reasons for this omission in the second part of my presentation.

2. Why was science policy an essential theme at that time?

To answer this question I base myself on the excellent report of the task force on science policy of the committee on science and technology of the US house of representatives published in September 1986 with the title "A HISTORY OF SCIENCE POLICY IN THE UNITED STATES, 1940-1985".
In its sixth chapter "Sputnik and its Aftermath, 1957-1965" the measures taken by the Eisenhower administration as a reaction to the Soviet successes with their Sputnik-satellites are described. They reflected this government's conviction of the important role which education and research played in order to achieve political and military preeminence in our modern world. For this reason the US political leaders assigned a first priority to the governmental support in these two fields and created an organizational infrastructure within its administration for planning and implementing the corresponding initiatives.

The report states that these measures did not represent a clearly defined and coordinated but only a "de facto" science policy of the US-government. Its assertion "The Federal support of science is, and always has been, accomplished through a pluralistic, interrelated system." holds even true nowadays.

In our small country with much more limited financial and personal resources we can't afford such a multipronged approach. Therefore the isolated case by case consideration of the needs of Swiss science which prevailed at that time has been gradually replaced by an integrated approach based on a longer term (4 years) coherent examination of the needs and planning of the measures as the engagements of the Confederation for promoting research and education increased. The institution of a Science Council in 1965 and under my directorship of the Division for Science and Research in 1969 (replaced eventually by the State Secretariat for Education and Research) in the Department of Home Affairs made the formulation and execution of a comprehensive coordinated science policy possible.

It has to be recalled also that the term "science policy (Wissenschaftspolitik)" did not appear in the Swiss political discussions until the beginnings of the 1960's. The US deliberations on measures for their Science policies which preceded in general ours could therefore furnish useful insights for the corresponding Swiss discussions.

Besides the reaction of the Eisenhower Administration to the Sputnik shock the replacement of the US-policies of strict secrecy by giving a wider access to informations on the US-advances in science and technology as demonstrated by its "Atoms for Peace" offer of 1953 furnished a second important reason to recruit a scientist for the embassy in Washington. The conclusion of the "Agreement for Co-operation between the Swiss Federal Council and the Government of the United States of America concerning Peaceful Uses of Nuclear Energy" in 1956 allowed the realization of ambitions of Swiss industry to acquire nuclear technology as a new promising field of activity. This led to a considerable involvement of the embassy in the implementation of this collaboration. But it permitted me also to insert these activities into the larger framework of the topic "science policy". However there did not exist then an office in the federal administration in charge of preparing and executing a comprehensive science policy so that Switzerland had at that time also a de facto science policy. Therefore my activities in this field were ad hoc and limited to reporting on some

specific problems with which the Swiss government was confronted. In the following chapter a selection of such reports is presented briefly.

3. My contribution to the then de facto science policy of the Swiss government

My reporting covered not only developments in the US-science policy but also certain problems of our domestic policy. With the already mentioned creation of the Swiss Science Council and the Division of Science and Research the latter reporting represents no longer a duty of the science counselor. Here some samples of my then activities in this field:

Reports on science policy:

a. Staat und technischer Fortschritt in den USA mit Anhang "Angaben über die Aufwendungen für Forschung und Entwicklung in den USA" 16. 4.59
   In this report I showed how well the US administration supported research and development in the universities, the industry and in its proper establishments and described the impressive budgets for financing such efforts.
b. Bericht über die Dienstreise des wissenschaftlichen Attachés, 25.02.59
   In this document of 35 pages I gave a rather detailed account of my first official visit to Switzerland which took place from 18.01.59 to 4.02.59. In more than 30 meetings and personal conversations with representatives of the federal administration, the universities and the private industry I explored the expectations and recommendations for my activities in the US.
c. Die Lage der technischen und naturwissenschaftlichen Forschung in der Schweiz , 11. 4.59
   In this paper I reported in more detail my impressions and the complaints which I had collected on the visits of the science departments in the Swiss universities and of research laboratories in the Swiss industry during the mentioned stay in Switzerland. Although the Confederation had increased its support of basic research by financing the Swiss National Science Foundation its yearly contributions to it were still quite modest. Thus backlogs persisted particularly in the universities in the equipment of their institutes in the natural sciences when compared to the situation in the US. The industrial r&d suffered of a too great fragmentation of the available personal and financial resources due to a serious lack of cooperation between the Swiss industrial enterprises.
d. Brief an Dr. V. Umbricht, (Direktor Eidg. Finanzverwaltung) über die Notwendigkeit der Neugestaltung der Forschungsförderung beim Bund 4.08.60
   The addressee of this letter of five pages played an important role in the federal administration since he directed the office responsible for financial matters. After reading some of my reports on the developments in the US research policy he had sent a letter to me in which he expressed his reservations about how far the measures taken by the US government could serve as examples for similar initiatives of our confederation. I agreed with him that the particularities

and political traditions of our small country required a somewhat different approach. But the obvious difficulties which our researchers in the natural and technical sciences encountered when they tried to keep up with the dynamic scientific developments in the US showed that the Federal government had to realize more and stronger initiatives in its support of research. I insisted that this required in particular the establishment of an institution in the Swiss administration which could coordinate the governmental support of research. I also indicated my personal interest in the creation of such a body since it could help the science counselor by functioning as liaison to those expecting a support from me. In my letter I justified the vagueness of my proposals by my conviction that such an institution had to be organized based on initiatives within Switzerland in order to avoid the usual resistance to anything coming from the outside.

e. Materialforschung in den USA, 11.11.60

My visits in Switzerland convinced me that there did not exist sufficient research on new materials in our universities and in industry. For this reason I collected informations on the impressive activities in this field supported by the US National Science Foundation and military agencies.

f. Die Elektronik in der Schweiz, 22.12.60

On June 29 1960 a member of the National Council, Edmund Wyss, and 36 cosignatories submitted a postulate with the title „research in the field of electronics“. It asked the Federal Council “if he is ready to promote research in the field of electronics as generously as atomic research.” Federal Councillor Tschudi, head of the Department of Home Affairs, wanted to know my position on the implied suggestion that the Confederation establishes such a special support for r&d in electronics when I visited him on my third official trip in November 1960. After my return to Washington D.C. I consulted telephonically three Swiss specialists, who had leading industrial positions in this field, Dr. W. Känzig (General Electric Research Laboratory), Dr. R. Peter (Bell Telephone Laboratory) und Dr. G. Wannier (Bell Telephone Laboratory, Murray Hill, N.Y.). All three agreed that Switzerland had produced some internationally recognized individual advances in electronics, but over all research in this field was not sufficiently cultivated in its industry and universities. Känzig and Peter, who returned later on as professors, suggested the creation of a national research center whereas Wannier preferred the reinforcement of existing good research groups. I complemented my protocols of these phone calls with my own recommendation in favor of the suggested special support because the industrial exploitation of electronics (especially for manufacturing watches) seemed to me particularly adapted to a scientifically advanced country which lacked own resources of raw materials. I sent this information to Tschudi and integrated it in a more comprehensive report -

which Federal Councillor Petitpierre had requested - with the title mentioned at the beginning of this paragraph. I added to it my forecast that in a foreseeable future a considerable miniaturization and probably reduction in price of electronic products such as computers will take place. This prediction materialized since then even more than I expected at that time.

Reports on problems of the „BRAIN DRAIN":

i. Die Lage des Schweizer Naturwissenschafters, Mediziners und Ingenieurs in den USA (Bericht über einen Diskussionsabend auf der Residenz von Herrn de Torrente" am 4.4.59), 30. 4.59

In this document I report on a meeting with the Swiss scientists and engineers residing in the consular district for which the embassy was responsible. My ambassador invited them for a dinner at his residence and I discussed with them their situation in the US especially in comparison with their corresponding experiences in Switzerland.

ii. Bericht über die Zusammenkunft mit Auslandschweizer Ingenieuren und Wissenschaftern am 30.1. 60 in New York

This is the report on a similar event in the residence of the Swiss consul-general in New York.

iii. Die Schweizer Wissenschafter und Ingenieure in den USA", 7. 07.60

In this report I summarized the discussions which I had with Swiss scientists and engineers in the residences of the ambassador 1959, respectively of the consuls-general in Chicago December 1959, New York January 1960, Philadelphia February 1960, San Francisco and Los Angeles March 1960. It covered the professional and social conditions which they met in their host country. All of these emigrants stressed the considerable freedom which they enjoyed in organizing their work, the generous policy of promotion, the good offers of their employers for continued professional education and the complete freedom when changing job. This contrasted with the more restrictive conditions they had encountered in Switzerland. As to the social environment they and their families met in the States they mentioned more negative experiences. Quite often they had difficulties in adapting to the American way of life. Those who had children regretted the weakness of the public US school systems. To overcome it required considerable financial resources if they wanted a good education for their progeny. This represented an important motivation for their interest in the possibilities to return home. But they were not inclined to go back unless they had an offer for an attractive position.

The economic boom and the considerable increase of the expenditures of the Federal Government for science and education in the sixties and seventies of the last century helped to improve considerably the Swiss professional situation. Therefore quite a number of those emigrants returned so that the problem of the “brain drain” disappeared. The interest for a

stay in the US remained among the graduates of the Swiss institutes of higher learning. However this led more and more to a balanced scientific exchange between the two countries since many of the Swiss immigrants to the US came back after a few years of fruitful professional activities in America.

iv. Bulletin für die Schweizer Wissenschafter und Ingenieure in Nordamerika

I created this periodical in order to keep those Swiss scientists, engineers and physicians informed on developments in Switzerland which might be of interest to them especially if they planned to return eventually to this country. It contained clippings from Swiss newspapers and scientific and technical periodicals selected by me, want ads of Swiss universities and private companies and a section with news on events in the cultural and social field back home supplied by the social attaché of our embassy in the US capital, Dr. Lukas Burckhardt. The bulletin was distributed free of charge to those Swiss emigrants who returned a filled questionnaire elaborated by me for obtaining a minimum of information on their professional qualifications and activities. Thus an inventory of more than a thousand such Swiss specialists working in North America could be established. The first bulletin was sent out at the end of November 1960 to 820 recipients. The Swiss institutes of higher learning and some private companies furnished increasingly short news on their activities for this publication after its successful start. With the advent of the internet such a source of information became obsolete and was given up.

3. A current important topic of US-science policy

Starting in 2009 a new president will shape US-science policies At the same time his government as well as ours will have to overcome an enormous financial crisis. The way he will master this situation will probably also influence the future Swiss science policy. Therefore it will be interesting to watch the respective developments in Washington D.C.. In particular these concern certain promises declared in Obamas election campaign and detailed in a fact sheet on science on the Web. (See Obama plans for science policy on the internet address: http://www.barackobama.com/pdf/issues/FactSheetScience.pdf)

Some of those which correspond to postulates of the Swiss science community are:

- Doubling over a 10 year period the federal investment in basic research by key science agencies, with a special emphasis on supporting young researchers at the beginning of their careers, and backing high-risk, high-return research.
  The Swiss government and parliament has already agreed to increase considerably the support of basic research, which is mainly administered by the Swiss National Science Foundation. This covers the legislative period which has started in 2008 and lasts for four years. But the parliament has still the possibility to reduce the accepted amounts for the subsidies to this institution – as it has done in earlier years - when discussing the annual budget of the Confederation and there exists a need for economies. Therefore the realization

of Obama's stated intention might influence positively the attitude of the federal parliamentarians in spite of the present worldwide financial catastrophe which will certainly also affect the Swiss public finances.

- Appoint individuals with strong science and technology backgrounds to the growing number of senior management positions where decisions must consider science and technology advice.

  In my career in the federal administration in which I was promoted to a chief position already at the age of 35 years I encountered several critics who confronted me with their opinion that such positions should be reserved to jurists or at the most to economists since according to our political preferences the Swiss government should mainly react to initiatives coming from the outside. This requires the preparation of a legal basis and its interpretation and execution. These activities should be led by state employees with a background in public law, whereas when such requests dealt with scientific or technical matters the necessary expertise could be obtained ad hoc from external sources.
  But this conviction did not take into account that during World War II the governments in all the bigger countries involved in this conflict had to assume a leading role in their war efforts which relied essentially on r&d in the sciences and technology. It was recognized that this required the integration of competent scientists and engineers into the administration. Especially in the US but also in other countries outstanding scientific and technical experts from universities and the industry were recruited for services within the administration. After the war those governments continued more or less this practice especially when the "cold war" led to a strong competition between the two blocs of western and communist states particularly in the sciences and technologies. I was and am convinced that the Swiss government has to follow suit for several reasons. Only two of them are given here:

  1. Our little country could only remain in the club of advanced nations by participating actively in the rapidly increasing international collaboration based on a partnership between governments and not only between individual academic institutions and private companies. As long as the Swiss government did not realize this situation our chief officials who had mostly a background in law or economics, were often confronted with scientific or technical interlocutors in this context which narrowed down the exchange of ideas in such meetings.

  2. The second reason is a consequence of the widespread abandonment of long term research by Swiss private industry that happened in the last decade of the previous century. Only the government remained as a partner who could contribute longer range thinking and efforts in this field to our country in the framework of its science policy. In order to discharge this responsibility it needs also measures similar to what was proposed in the Obama campaign.
     The appointment of science counselors to our embassies increased at least the still small number of scientists and engineers in the Swiss diplomatic service. But elsewhere in the Federal administration scientists and engineers are not yet sufficiently present except for the State Secretariat for Education and Research. In my efforts to build up a science administration in our capital I always insisted on recruiting men and women with a good background in natural sciences or

mathematics, or computer sciences or engineering for the offices which I directed. A number of those are still active in this State Secretariat.

As a conclusion to my remarks I formulate the following summary recommendation for reporting on science policy based on my experiences:

Reporting on science policy should be a priority of the science counselors. It should take into account the similarities and differences between the host country and Switzerland.