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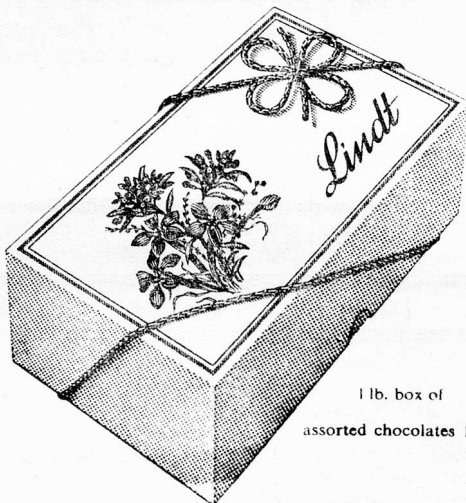
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## SWISS MERCANTILE SOCIETY.

### "Switzerland's Hydro-Electric Power and her Programme for Atomic Development."

(CONCLUSION.)

(c) Atomic energy.

Who would believe that 20 years ago Switzerland was one of the leading atomic powers in the world? At the National Exhibition in Zurich we were able to admire one of the first cyclotrons ever constructed. It was made in Switzerland! While in other countries, especially in the United States, Great Britain and Russia, the demands of the hot and the cold war encouraged scientists to make unprecedented efforts in the field of nuclear research and technique, in Switzerland almost every activity had to stop. Years after the war it was still impossible to get the basic material indispensable for the core of reactors and to participate in the no less important exchange of information across the frontiers. Not only did the use of the new energy for war purposes remain a top secret, but it was even so with its peaceful application.

It is astonishing that in spite of this situation the Federal Council set up, already in 1945, a commission for the study of atomic energy. In 1946 the Federal Assembly decided to provide this commission with a credit of 6 million Swiss francs. The possibility of constructing an atomic reactor for experimental purposes was discussed at the same time. Concrete projects have been elaborated in collaboration with the Federal Institute of Technology and the Swiss industry, especially the firms of Brown Boveri & Co., Sulzer Brothers Ltd. and Escher Wyss, who are joining forces in a working community.

In 1954 it became possible for the first time to obtain, by means of arrangements with foreign governments, the necessary quantity of nuclear fuel to ensure the realisation of the plans for Switzerland's first atomic reactor, as well as the heavy water needed for the moderator. 170 firms then got together and formed a limited company, Reaktor AG. Their financial contribution towards the construction of the reactor amounted to over 18 million francs, the Confederation paid 15 million, and another 30 million francs from federal funds has been promised for the further extension of the atomic research centre of Reaktor AG in Würenlingen, canton Aargau. An average number of 250 scientists and technicians are now working in Würenlingen. They have at their disposal the following installations and equipment:

1. One reactor for research and experimental work (called "Sapphire") especially designed for experiments in the field of neutrons physics and the training of students.
2. One reactor for the testing of materials and for large-scale experimental studies (called "Diorit").
3. One laboratory for the analysis of the experiments and to provide working places for physicists, chemists and metallurgists.
4. One so-called "hot lab" in which highly radioactive substances can be handled.

Other installations are being planned.

Besides the research work which is being done at Würenlingen I must also mention the basic research in nuclear physics, chemistry, biology, and in other fields, as well as — and this is specially important — the development of power reactors by industry. In this connection the Federal Assembly will soon have to decide the grant of another 40 millions as a contribution to the eight universities, where scientists of the future are being formed. This will not only help to maintain and develop the high esteem gained by our universities in the sphere of atomic sciences but it is a condition for keeping good Swiss and foreign scientists in the country and encouraging them to work there.

The planning, construction and development of energy-producing reactors on the other hand is generally the task of industry. Here again two problems have to be solved: the financial problem and the problem of personnel. One middle-size power reactor, with a production capacity of 20,000 kw, will cost a minimum of 40 to 60 million francs. This amount has to come from private sources, that is to say from the interested industry as a whole. The concentration of efforts, which is therefore an absolute necessity, is well on the way to being achieved. Do we have a sufficient number of well-trained scientists for the development of such a plant? Fifty experts will have to work for five years to complete the task. These fifty physicists, chemical engineers, metallurgists and electro-engineers are indeed available, but again the thing is to persuade them to join forces and work for a common cause.

Three projects for power reactors are at present under discussion in Switzerland:

1. A heavy water moderated reactor using slightly enriched uranium as fuel. This is the project of a group of industries under the leadership of Sulzer Brothers, Winterthur, and in collaboration with the Federal Institute of Technology.

2. "Energie nucléaire SA" in Lausanne intend to build an underground boiling water reactor, light water moderated, and working on enriched uranium. This type of reactor has been developed in the United States. It should produce 20,000 kw, and its first output is intended to provide the National Exhibition of 1964 with the necessary energy.
3. A year ago a number of Swiss associations concerned with power production founded Suisatom AG. This company have planned the construction of an atomic power plant using 5 tons of uranium oxide and producing at the start 90,000 kwh, to be stepped up later to 140,000 kwh. For security reasons it will be housed entirely in a rock cavern, near Villigen in the Canton of Argau. The cost is 45 million francs.

As you can see from this survey, Switzerland is taking the measures that are necessary to complement with nuclear energy the traditional sources of energy, and that with a view not only to the production of electric current but also to the extraction of energy for heating purposes.

There is another problem which must not be neglected if we do not want to be left behind in the "atomic revolution". I am thinking of the purely economic and commercial interest which our industry, and especially the export industry, has to consider in connection with research and the peaceful use of the power released through atomic fission. Switzerland is exporting great quantities of power machines, testing machines and instruments of all kinds. More and more of them will be required for installations in atomic power plants. New constructions are therefore necessary, and we cannot just copy what others have done. If Switzerland is to keep her position as an exporting country she must surprise her customers and competitors with her own inventions and creations.

I may say that the Swiss industry, particularly the engineering branch, is going well ahead, doing all that is necessary to adapt itself to the new technique and even to play a prominent part in it. It is worth mentioning that 23 Swiss firms participated in the recent "Atoms for Peace" exhibition in Geneva and that a number of exhibits had been manufactured according to entirely new methods. Some Swiss firms are already exporting machines, as well as instruments for measuring and testing purposes. Even Great Britain is among our customers!

Obviously, however, Switzerland's financial means are limited and cannot compare with those available to the big industrial countries. Less favoured than the latter, Switzerland realised that it was only by co-operating in the international field that she would be able to obtain the uranium she requires (it is uncertain whether the deposits of this element discovered in the Valais last year will be worth exploiting). And only through such co-operation can she profit from the work carried out in other countries, offering in exchange the results of her own experiments. Consequently, agreements concerning these matters have been concluded with the United States, France, Canada and Belgium. We know about the first spectacular result of this co-operation: the putting into operation of the first experimental reactor on Swiss soil, the "Sapphire", which was made in America and assembled at Würenlingen.

Besides the arrangements with the above-mentioned States, Switzerland also belongs to several important international organisations: CERN ("Centre européen pour la recherche nucléaire") at Geneva, where the most powerful proton-synchrotron plant in the world is being installed; the International Atomic Agency in Vienna, concerned with the distribution of fissile material; the European Agency for Nuclear Energy in Paris, whose main purpose is to create common enterprises to stimulate applied research work. The first project recently instituted is an experimental hot water reactor at Halden, in Norway, the second an experimental plant to be built at Moll, in Belgium, by Eurochemic. A few weeks ago the Federal Assembly also decided that Switzerland will participate, with a contribution of 4 million Swiss francs, in the construction of the experimental reactor at Winfrith Heath, Dorset. (Denmark, Sweden and Norway will also contribute 4 million each, and Great Britain and Euratom 52 million each, the total cost being estimated at 160 million.)

Other international bodies, concerned with security control, technical and legal problems, will soon be set up by OEEC. There is no doubt that Switzerland will support these efforts as a member.

In Switzerland itself the population is taking quite an active part in the discussion about atomic energy, a discussion which involves, as it does in Great Britain (if under a different aspect), economic, scientific, political and military problems. We may say that the Swiss people generally realise the importance of the development of the country's atomic plans. In November last year it adopted a new article of the constitution giving the Confederation the necessary powers to legislate in the field of atomic energy. This Atom Bill has recently been submitted to the National Council and the States Council.

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**CITY SWISS CLUB**

**MONTHLY MEETING**

on Wednesday, 27th May 1959 at 6.30 for 7 p.m. at Dorchester Hotel, W.1. (Dinner at 7 p.m.)

**AGENDA**

**ALTERATION OF RULES**

Members wishing to be present should send their card to the Manager of Dorchester Hotel, W.1, to reach him not later than Tuesday, 26th May 1959.

THE COMMITTEE.