

**Zeitschrift:** Helvetia : magazine of the Swiss Society of New Zealand  
**Herausgeber:** Swiss Society of New Zealand  
**Band:** 40 (1975)  
**Heft:** [4]

**Artikel:** Swiss know-how for all continents  
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**DOI:** <https://doi.org/10.5169/seals-945683>

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## Swiss Know-how for All Continents

What is it that the electricity supply system of Pakistan, the water purification plant of Istanbul, Lima's underground, the Holland-Italy pipeline, the irrigation system of the Euphrates, the road tunnel through the Gotthard, the regulation of the River Senegal, the expansion and modernisation of agriculture in Honduras, the development of tourism in the Lebanon and the settlement between Tunisia and France regarding indemnities for nationalised enterprises have in common? Rather more than one might expect at first glance. For in the first place they are all schemes and projects involving the services of consulting engineers; secondly, these services — particularly in the developing countries — are channelled through international institutions; and last but not least, it so happens that the responsibility for all these undertakings is in the hands of Swiss companies.

### *Focus on feasibility*

These facts of course do not answer all the questions that are likely to rise in the reader's mind, and may well prompt many more. What exactly is consulting engineering? Why are the countries mentioned mostly in the less highly industrialised group, and what role do international institutions play? And why should a small land-locked European country like Switzerland be entrusted with such assignments in all the continents?

To start with the first question, consulting engineering began as an

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Anglo-Saxon specialty and developed its full scope only after the Second World War. The job thus designated—reduced to its simplest terms—is the overall direction of large, complex projects from their first conception through planning, development and financing to realisation and completion, sometimes including the supervision of operation for an initial period after the start-up.

At the outset there is normally a technical and economic concept and a client who wants it carried out. The consulting firm that is called in to do this must first examine from all angles the often rather vague plan of campaign with which the client wishes to achieve his objectives. These so-called feasibility studies are the core of consulting work, for it is of primordial importance that large and expensive schemes which may change whole landscapes should be thoroughly investigated, planned and worked out on paper to ensure that they are technically practicable and to clarify in advance their economic and ecological implications.

#### *Interdisciplinary teamwork*

It is obvious that the preparation of feasibility studies cannot be a one-man job. There will in every case be a project manager, but his function will be to keep everything in perspective, to entrust the solution of the various problems to qualified specialists and to co-ordinate the results from all the fields involved. What materialises is a fine network of interdisciplinary co-operation which can only succeed on the basis of well-organised teamwork. The structure of the big Swiss consulting firms has many similarities to a university in the original sense of the word, for the faculties represented by the various members of the organisation must be practically universal. Apart from the engineers proper—who will be electrical, mechanical, civil, hydraulic, thermal and nuclear engineers — the organisation will also include architects, geologists, physicists, chemists, physicians, biologists, lawyers, economists and production engineers as well as specialists in planning, organisation, administration, automation and electronic data processing.

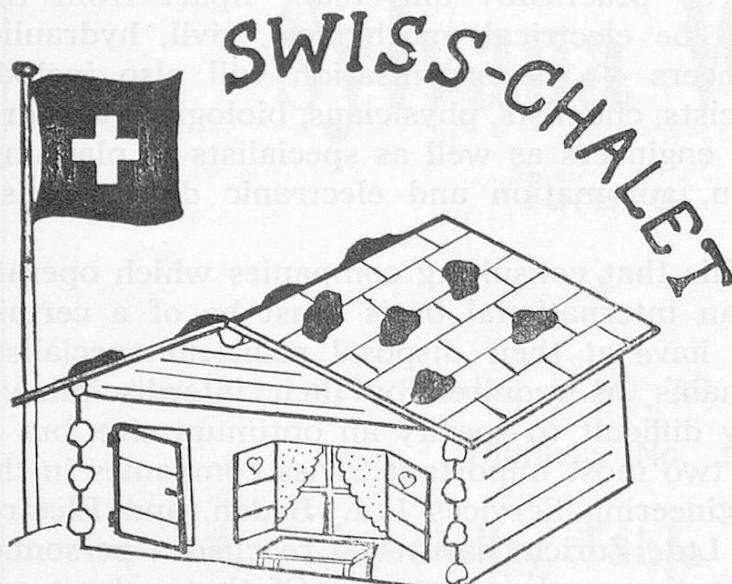
It will be clear from this that consulting companies which operate on a large scale and on an international basis must be of a certain minimum size in order to have at their disposal sufficient specialists from all the relevant domains, as required by their interdisciplinary approach. It is admittedly difficult to specify an optimum size, but it is worthy of note that the two most important Swiss companies in the field, Motor Columbus Engineering Services Ltd., Baden, and Electro-Watt Engineering Services Ltd., Zurich, have each reached a personnel level of something over one thousand employees. Of these, about one third are university graduates, one third hold technical diplomas, while the rest are office workers and ancillary personnel.

The two companies just mentioned are among the largest of their kind in Europe, but it should be added that there are consulting companies in the United States that have twice or three times their personnel potential. On the other hand, there are also some medium to small consulting firms in Switzerland which belong to the Union de Societes

suisses d'ingénieurs-conseils (USSI), and some of which take on foreign assignments. The greater part of the activity of the six firms which, together with the two larger companies already mentioned, form the national association is principally centred upon to Switzerland. By contrast, a good 40 per cent of the revenues of Motor Columbus Engineering Services Ltd., which concentrates on the fields of electro-mechanical engineering and economics, derives from consulting work for foreign clients, while Electro-Watt Engineering Services Ltd., with the emphasis on structural engineering, draws a slightly smaller proportion of its earnings from abroad. A few of the more important Swiss industrial enterprises also have their own engineering departments, which are however mainly product-oriented and therefore do not exercise the same consulting functions as the specialised companies. Motor Columbus Engineering Services Ltd. is fully owned by the Motor Columbus Holding, an independent electricity company and public utility, a 38-per-cent minority share in which was recently acquired by Alusuisse. Electro-Watt Engineering Services Ltd. is a 100-per-cent affiliate of the Electro-Watt Holding, a majority interest in which is held by the Swiss Credit Bank.

#### *Concrete development aid*

The reason why consulting engineering is so important for the developing countries, and why Switzerland has made a—for its size—large and remarkably successful contribution in this field, can only be rightly understood in a wider context. The need for industrialisation



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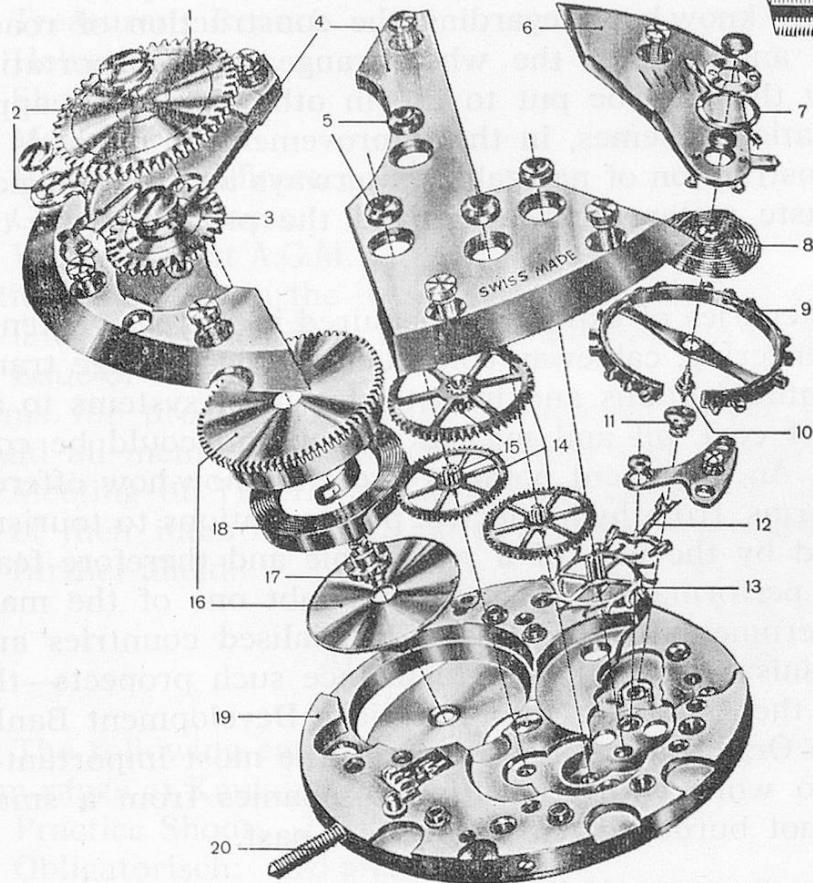
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and for other projects to increase production and employment is understandably greatest in the less developed parts of the world. These are also the countries that can least afford to squander their resources, so that the trustworthiness of feasibility studies and of cost and benefit analyses, as well as the execution of projects on time and within the budget, are considerations of the greatest importance to a country that has a contract to allocate. Experience also counts for a good deal in the export of know-how. Switzerland has some marked advantages in this respect both in the field of hydroelectric power generation and in the manufacture of the plants, machines and transmission equipment needed for it. Moreover, the development of engineering as an interdisciplinary service has produced a chain reaction, for instance because the provision of lines of communication and transport for hydroelectric dams has created new know-how regarding the construction of roads, tunnels and bridges and in fact the whole range of transportation engineering-know-how that can be put to use in other hydraulic applications such as irrigation schemes, in the improvement of methods of agriculture, in the construction of navigable waterways and in ecological domains such as waste water purification and the protection of the environment.

The list of the categories of experience acquired in this way extends from mechanical engineering, cableway construction, high-voltage transmission lines, telecommunications and industrial control systems to all aspects of the uses of coal, oil and nuclear power and could be continued almost ad lib. An important point is that the know-how offered by Swiss consulting firms, from hydroelectric power stations to tourism, is primarily motivated by the idea of a reasonable and therefore feasible improvement of performance. This is no doubt one of the main reasons why the governments of the less industrialised countries and the international organisations that help to finance such projects—the UN, the World Bank, the Asian and Inter-American Development Banks and the World Health Organisation, to name only the most important—show a willingness to work with consulting companies from a small and neutral country not burdened with a colonial past.

The fact that this concrete, individually directed economic aid — which is a form of incentive to self-help — is not given free of charge is evidently not regarded as a drawback by the clients in this case. The consulting fees represent an acceptable proportion of the costs of the whole project, as they do not exceed three to four per cent, even though the amounts involved are large, exceeding a thousand million Swiss francs per year for each of the two largest Swiss companies engaged in this work. And if a considerable proportion of the equipment orders for the projects are also placed with Swiss industrial enterprises, this is to a large extent due to the favourable image which the "Made in Switzerland" mark has earned for itself in the course of the years.

—Walter Gunthardt