

**THE WORLD BANK GROUP ARCHIVES**

**PUBLIC DISCLOSURE AUTHORIZED**

Folder Title: Hathaway, Gail A. - Articles and Speeches (1958 - 1963)

Folder ID: 1651853

Fonds: Records of Office of External Affairs (WB IBRD/IDA EXT)

Digitized: October 04, 2013

To cite materials from this archival folder, please follow the following format:

[Descriptive name of item], [Folder Title], Folder ID [Folder ID], World Bank Group Archives, Washington, D.C., United States.

The records in this folder were created or received by The World Bank in the course of its business.

The records that were created by the staff of The World Bank are subject to the Bank's copyright.

Please refer to <http://www.worldbank.org/terms-of-use-earchives> for full copyright terms of use and disclaimers.



THE WORLD BANK  
Washington, D.C.

© 2012 International Bank for Reconstruction and Development / International Development Association or  
The World Bank  
1818 H Street NW  
Washington DC 20433  
Telephone: 202-473-1000  
Internet: [www.worldbank.org](http://www.worldbank.org)

**PUBLIC DISCLOSURE AUTHORIZED**

Hathaway, GAIL A. — ARTICLES and SPEECHES (1958 - 1963)

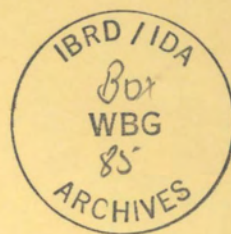


**DECLASSIFIED**  
WBG Archives

The World Bank Group  
**Archives**  
1651853  
A1992-007 Other #: 9  
Hathaway, Gail A. - Articles and Speeches (1958 - 1963) - 1v  
212054B









216

Ordered By Hathaway

50 c

delivered

to us.

10/27/58 - Reran 50c



ADDRESS BY GAIL A. HATHAWAY, ENGINEERING CONSULTANT  
 INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT  
 BEFORE INTERNATIONAL ASCE--IABSE MEETING, HOTEL STATLER  
 NEW YORK CITY, OCTOBER 14, 1958  
 - - - - -

First of all I should like to compliment the members of the Society and the U.S. Council of the International Association of Bridge and Structural Engineers on arranging a joint program which provides the opportunity for some of the world's leading authorities on the design and behavior of structures and properties of materials to come together and, without any political prejudices, exchange views and discuss current research developments and practice in Europe and the United States. May I also thank the officials of this International meeting for the opportunity to make a few remarks.

I have been asked to speak on "The Economic Aspects of International Engineering Projects". This is a broad subject which could be discussed from the viewpoint of the Consulting Engineer, the owner who is in many cases the potential borrower, or the organization that is being asked to assist in financing the project. I shall discuss the subject from the point of view of an organization that is now concerned primarily with the financing of productive projects in the less developed areas of the world, namely, the International Bank for Reconstruction and Development, popularly known as the World Bank.

The Bank began operations in 1946. It was set up as a channel for international investment to increase production, raise living standards and help bring about a better balance in world trade. The 68 member countries of the Bank are its stockholders, each subscribing to its capital stock in accordance with their economic strength. For example, the U.S. contribution is \$3½ billion, or over 30%, and that of Panama is \$200,000,



or less than .001%. The total subscribed capital of the Bank is \$9.5 billion. Of this amount, however, only 20 per cent is paid in, partly in gold or dollars and partly in local currencies. The remaining 80 per cent is subject to call only if required to meet the Bank's obligations. The Bank is not only a lender but also a borrower, since the capital subscribed by its member governments was never intended to finance all its operations. In fact, although the Bank has already paid out about \$2,800 million on its loans, it has used or allocated only the equivalent of \$1,400 million from government subscriptions. The remainder of its funds has been drawn mainly from the sale of its bonds in the capital markets of the world. The Bank has already made 214 loans in 47 countries, totaling over \$4 billions. About a third of the Bank's development lending has been for electric power and has helped to finance the addition of eight million kilowatts to the world's generating capacity--more than the total generating capacity existing in the whole of Latin America at the end of World War II. Another third of our lending has been for transport movement--railways, highways, air and waterways. The remaining third of the Bank's loans has been for agriculture, especially irrigation; for industry, especially steel production; and for general development purposes.

In making its loans the Bank is obliged by its Charter to pay "due regard to the prospects that the borrower, and, if the borrower is not a member, that the guarantor, will be in a position to meet its obligation under the loan"; the Charter further requires the Bank to act "prudently" in the interests both of the borrowing country and of the members as a whole. In any case, even if this provision did not exist the Bank could not endure as a continuing institution, operating on a



sound business basis and with funds borrowed in the private market, if it did not take care to make loans only where there are reasonable prospects of repayment.

First of all, we have to decide whether the would-be borrowing country is in a position to borrow at all. This involves an examination of the existing debt burden of that country, the schedule of service payments over the following period of years, the likely earnings of foreign exchange over the period of the loan, and so forth. There are some countries in the world which are not economically viable, which exist through the generosity of one or more of the richer nations. In such cases as this the World Bank does not embark upon a lending program. On the other hand, the majority of countries are in a position to undertake some further debt and the Bank has to make a careful and conservative assessment of the ceiling or upper limit which it thinks it could prudently lend.

The assessment of repayment prospects also requires us, of course, to evaluate the effectiveness of the government administration and of the business community, the availability of managerial, supervisory and technical skills, the scale and character of investment, and the economic and financial policies which are likely to be followed, particularly as they affect the level of domestic savings and the flow of foreign private capital.

But creditworthiness, as we call it, is not determined only by statistics; within fairly wide limits it is determined also by the intangible factor of the country's attitude towards its foreign debts. A country which shows a willingness to pay its debts at the expense, if necessary, of sacri-



fices at home is plainly a better credit risk than another, even with a stronger economy, which does not treat its foreign obligations with equal respect. So a country's past debt record is significant. Experience has shown that loans are likely to be most effective, and repayment prospects therefore brightest, where the government shows a serious and **courageous** approach to its economic and financial problems and regards the maintenance of both internal stability and external credit as important to the country's long-term development.

Underlying many of our lending policies is the provision of the Charter that Bank loans "shall, except in special circumstances, be for the purpose of specific projects of reconstruction or development". The object of this provision is to assure that Bank loans will be used for the most productive purposes. In fact, every effort is made in the case of each borrowing country to determine what are the appropriate investment priorities and then to adapt our financial assistance to meet the priority needs. Member countries of the Bank are encouraged to formulate long-term development programs and to assist in this programming we provide some of them with substantial technical assistance.

There is no single test by which the relative urgency and productivity of various alternate projects can be judged. The available resources of each country, and its capacity to borrow abroad, are limited. Therefore, if they are to do the most good, our investments must be devoted to those undertakings which will contribute most to strengthening the economy of the borrowing country. The situation in each country must be considered on its own merits. In every case, however, the Bank's general approach is the same: it seeks first to determine what are, or should be,



the important aims of a proper investment program and then to gauge the relative priority of the various projects by the extent of their contribution to those aims. In this category, for example, comes the problem of how to deal with those less developed countries who think that large-scale industrialization is the key to prosperity, even though they possess neither sufficient resources nor demand to justify such a course.

The relative profitability of different projects is frequently not a sufficient test of their respective contributions to a country's development. In many cases, certain basic investments in public utilities, transportation and ports, flood control, irrigation and similar projects are required before other investments can be undertaken. The indirect benefits arising from these basic investments may be very great even though the direct earnings, at least in the short run, are not high or may even be non-existent. For example, a highway system, unless it involves toll roads, yields no direct revenue but it may foster all kinds of industrial and agricultural activity.

Deciding on the priority of the project is, of course, only a first step. The Bank also needs to assure itself that the technical, financial and administrative plans for the project are satisfactory. These points often involve investigation, study and negotiation over a broad field. For example, we have to be satisfied that the engineering plans have been competently drawn, that the project is suitably designed, and that construction will be entrusted to competent hands and will be properly supervised. In making the necessary preparations for a successful project we believe that considerable advantages can often be obtained if the borrower calls in consultants for the planning, design and supervision of construction.



In these matters the Bank is guided by the advice of engineering specialists on its own technical staff, and by the reports of the consultants whom our borrowers employ or, in some cases, whom the Bank hires directly. The Bank does not itself select consulting engineers for the projects it is helping to finance, but leaves it to the borrowers to arrange this service. The Bank must, of course, be satisfied that the firms appointed have had satisfactory experience on comparable projects, that the staff to be assigned to the particular work are qualified and that the terms of reference under which they are employed are such as to assure satisfactory execution of the project. Also, the Bank places particular stress upon the assurance of adequate management for the project when it comes into operation--a problem of substantial difficulty in many less developed countries where managerial and administrative experience is often extremely limited.

It is the Bank's established practice not to finance the entire cost of any project or program. Our normal operation takes the form of a loan in foreign exchange to finance the foreign exchange costs of the project. In accordance with provisions of the Bank's Charter expenditure of the loan is not tied to any particular source of supply; borrowers are free to use the proceeds to make purchases in any member country (and in Switzerland, which has a special relationship with the Bank). As a cooperative international institution charged with promoting the "long range balanced growth of international trade" the Bank wishes all of its member countries to have a fair opportunity to supply goods to Bank borrowers. We therefore encourage the use of international competitive bidding except when this procedure is clearly inappropriate. In some



cases our borrowers are advised to employ a qualified consultant to assist in determining the qualifications of bidders, in preparing specifications and in analyzing bids. However, circumstances will sometimes arise wherein international competition may not be appropriate because of the borrower's desire, for operating reasons, to continue with certain types of equipment in order to avoid complications and expense in maintenance and spare parts; the availability of dealers' maintenance and service facilities for specific types of equipment; or the fact that the equipment required is available only in one market.

The Bank never requires, or even proposes, that a borrower should place a contract with a designated supplier of goods or services or that competition should be restricted to a designated group of suppliers. Nor does the Bank furnish lists of suppliers to its borrowers. The decision regarding which suppliers should be invited to bid and to which of them the contract is to be awarded is the responsibility of the borrower, subject only to his ability to satisfy us as to the suitability of the goods and the reasonableness of the terms of purchase.

It often happens that when we look at economic conditions in a borrowing country we find that some of the policies being pursued adversely affect the economic stability of the country, and that, if these continued, they would endanger both the productive purposes and the repayment prospects of a Bank loan. In such cases it is our policy to require, as a condition of our financing, the borrowing country to institute measures designed to restore stability. Moreover, the Bank has a direct interest in the creation and maintenance of satisfactory relations between its member countries and their external creditors. Accordingly, it is our normal practice to tell loan applicants who are in default on their foreign



debts that the Bank cannot assist them unless they take appropriate steps to reach a fair and equitable settlement of their debts. It may be added that the Bank has been greatly encouraged by the progress made by its member countries in recent years in clearing up defaults. I believe it is fair to state that this policy of the Bank played a large part in helping to end the state of default that, only a few years ago, existed over so large a part of Latin America and elsewhere.

There are other policies which may cause the Bank grave concern. For example, there is the widespread tendency to sell electric power so cheaply that the power companies, whether private or public, cannot operate on a sound business basis, still less provide for future expansion. Indeed, in many of these countries, after some years of these rate policies, they have good reason to accept the old saying that the most expensive kilowatt is the one you haven't got. The Bank therefore makes every effort to ensure that the prices to be charged for the end-product, whether it be power, steel or freight charges, will be adequate to meet all costs.

As has already been indicated, most of the Bank's loans are for such basic utilities as highways, railroads, power facilities, irrigation and reclamation projects--which are an essential condition for the growth of private enterprise. The resulting expansion of utility services, particularly of power and transportation, lays the foundations for the later development of private initiative in industrial, agricultural, mining and other undertakings.

In fact, the promotion of private enterprise is a central part of our effort at the World Bank. We believe that governments should be fully occupied looking after those public services which governments must



provide, and that they should not try, in addition, to carry on activities for which government operation is inappropriate. Our lending for industry has been almost entirely to private corporations, including both the private steel companies of India, the steel industry of Japan, paper manufacturers in Chile, cement producers in Peru, and so on. A great deal of our lending for electric power has been to privately-owned utility companies, and we are alert always for new opportunities to assist the private sector. This is a natural corollary of the fact that the great majority of the money we lend nowadays comes from private investors who lend their money to us and thereby increase the flow of private capital into international development. By and large the World Bank has had a successful beginning, both in terms of the success of the projects which it has helped to finance, and in commercial terms. We have now accumulated total reserves of more than \$360 million and our net earnings for the last fiscal year were over \$40 million. The more we can produce results of this kind, the more we can restore the confidence of private investors in overseas loans, provided they are well made and well administered.



Address by Gail A. Hathaway, Engineering Consultant  
International Bank for Reconstruction and Development  
Before 1958 Convention of Professional Engineers of Oregon  
Multnomah Hotel, Portland, Oregon  
November 8, 1958

=====



I consider it an honor and a privilege, which I appreciate deeply, to be invited to participate in the activities of your 1958 Convention. There is a great deal to be gained in the exchange of views between members attending the technical sessions held during the past two days. Equally important is the opportunity for strengthening the bonds of friendship among the professional engineers of Oregon.

It so happens that I had the good fortune to spend over thirty years as a resident of Oregon, mostly in the upper Willamette Valley near Eugene. Upon completion of my civil engineering course at Oregon State, Mrs. Hathaway and I lived at Bend for a short period and then moved to Salem. I still recall vividly a summer spent in Harney Valley working for Mr. John Cunningham, the senior member of one of Portland's prominent consulting firms. It was indeed a struggle trying to close certain damsite and reservoir surveys on the Silvies River, as well as tie in our topographic surveys of the irrigable area in the valley to those elusive Section Corners, which were described in the General Land Office records as a willow post surrounded by four small earth mounds. The General Land Office surveys were made years ago, and many of the willow posts disappeared before the turn of the century.

It is my understanding conditions have in many respects changed since I left the State in 1928, but it was a foregone conclusion amongst my associates while serving as one of the Assistant State Water Engineers in Salem that when the trout season opened in the spring I was sure to have urgent business in the headwaters of the Deschutes River, generally at North or South Twin Lake; or there were important water disputes to settle on



Mill Creek or Butter Creek in Umatilla County at the time of the Pendleton Roundup; or it was essential that a visit be made to the Leopold and Stevens Water Stage Recorder on Trout Creek at Denio, which is within commuting distance of those enormous 300 pound mule deer bucks that inhabit the breaks of the Steens Mountain escarpment. Notwithstanding the many improvements made in the Stevens Recorder, they do need attention, particularly in the fall of the year.

I trust you will pardon this brief bit of reminiscence regarding some assignments during the gay twenties which, I assure you, also involved a great deal of hard work. However, your Program Chairman has asked me to tell you something about the activities of the World Bank, the type of projects with which the Bank is concerned and the role of the engineers in connection with these projects. This is a subject on which I shall be tempted to speak at such length as to exhaust the tolerance of even such gracious hosts as yourself, Mr. Chairman. The fact is the engineers associated with the World Bank are called upon not only to exercise their normal professional skills, but also to operate in fields of finance, economics and even accountancy.

But let me first say a few words about the World Bank, in case some of you are not familiar with its functions.

The International Bank for Reconstruction and Development, generally referred to as the World Bank, began operations in 1946. It was set up as a channel for international investment to increase production, raise living standards and help bring about a better balance in world trade. The 68 member countries of the Bank are its stockholders, each subscribing to its capital stock in accordance with their economic strength. For example, the U.S. contribution is \$3½ billion, or over 30% and that of Panama is \$200,000 or



less than .001%. The total subscribed capital of the Bank is \$9.5 billion. Of this amount, however, only 20 per cent is paid in, partly in gold or dollars and partly in local currencies. The remaining 80 per cent is subject to call only if required to meet the Bank's obligations. The Bank is not only a lender but also a borrower, since the capital subscribed by its member governments was never intended to finance all its operations. In fact, although the Bank has already paid out about \$2,800 million on its loans, it has used or allocated only the equivalent of \$1,400 million from government subscriptions. The remainder of its funds has been drawn mainly from the sale of its bonds in the capital markets of the world. The Bank has already made 216 loans in 49 countries, totaling over \$4 billions. About a third of the Bank's development lending has been for electric power and has helped to finance the addition of eight million kilowatts to the world's generating capacity--more than the total generating capacity existing in the whole of Latin America at the end of World War II. Another third of our lending has been for transport movement--railways, highways, air and waterways. The remaining third of the Bank's loans has been for agriculture, especially irrigation; for industry, especially steel production; and for general development purposes.

In making its loans the Bank is obliged by its Charter to pay "due regard to the prospects that the borrower, and, if the borrower is not a member, that the guarantor, will be in a position to meet its obligation under the loan"; the Charter further requires the Bank to act "prudently" in the interests both of the borrowing country and of the members as a whole. In any case, even if this provision did not exist the Bank could not endure as a continuing institution, operating on a sound business basis and with funds borrowed in the private market, if it did not take care to make loans only where there are reasonable prospects of repayment.



First of all, we have to decide whether the would-be borrowing country is in a position to borrow at all. This involves an examination of the existing debt burden of that country, the schedule of service payments over the following period of years, the likely earnings of foreign exchange over the period of the loan, and so forth. There are some countries in the world which are not economically viable, which exist through the generosity of one or more of the richer nations. In such cases as this the World Bank does not embark upon a lending program. On the other hand, the majority of countries are in a position to undertake some further debt and the Bank has to make a careful and conservative assessment of the ceiling or upper limit which it thinks it could prudently lend.

The assessment of repayment prospects also requires us, of course, to evaluate the effectiveness of the government administration and of the business community, the availability of managerial, supervisory and technical skills, the scale and character of investment, and the economic and financial policies which are likely to be followed, particularly as they affect the level of domestic savings and the flow of foreign private capital.

To do the most good, our investments must be devoted to those undertakings which will contribute most to strengthening the economy of the borrowing country. The situation in each country must be considered on its own merits.

The relative profitability of different projects is, however, frequently not a sufficient test of their respective contributions to a country's development. In many cases, certain basic investments in public utilities, transportation and ports, flood control, irrigation and similar projects are required before other investments can be undertaken. The indirect benefits arising from these basic investments may be very great



even though the direct earnings, at least in the short run, are not high or may even be non-existent. For example, a highway system, unless it involves toll roads, yields no direct revenue but it may foster all kinds of industrial and agricultural activity.

Deciding on the economic benefits to be expected from the project is, of course, only a first step. The Bank also needs to assure itself that the technical, financial and administrative plans are satisfactory. These points often involve study and negotiation over a broad field. For example, we have to be satisfied that the engineering plans have been competently drawn, that the project is suitably designed, and that construction will be entrusted to competent hands and will be properly supervised. In making the necessary preparations for a successful project we believe that considerable advantages can often be obtained if the borrower calls in consultants for the planning, design and supervision of construction.

In connection with the employment of consulting engineers for the projects the Bank is helping to finance, it is our policy to leave their selection to the borrower. The Bank must, of course, be satisfied that the firms appointed have had satisfactory experience on comparable projects, that the staff to be assigned to the particular work are qualified and that the terms of reference under which they are employed are such as to assure satisfactory execution of the project.

The Bank also relies heavily upon the advice of the engineering specialists on its own technical staff. These specialists are members of the Department of Technical Operations which has the responsibility of assessing the merits of projects proposed to the Bank for financing; recommends to the Management of the Bank the amount, duration and special conditions



of each loan, and follows the progress of projects financed with the help of the Bank. The Department is divided into four divisions corresponding to the four main types of projects financed: Public Utilities, especially electric power; Transportation; Industry and Agriculture. All of the engineers employed by the Bank are assigned to the Department of Technical Operations, which has a total staff of about 100 persons, of which 27 are engineers, 15 are financial analysts, 11 are economists and 4 are agriculturists. This professional staff of 16 different nationalities works together as a team.

As you will have already realized, the operations of the Bank are not only large, they are also extensive. We have projects to consider in 49 different countries on six continents. We have to report on future projects, on those under construction and also on projects already completed, of whose effectiveness the Bank wishes to be informed. Obviously, in this situation none of the Bank's engineers can be a narrow specialist. He has to be able to cover a good deal of ground, in every sense of the word. But that is not all. As I have just said, the Bank looks to the Technical Operations Department for advice on the financing of the loan, involving the Department in scrutiny of balance sheets, cash flow, and all sorts of other things. We are not in a position to send large numbers of people round the world, each asking the questions that lie in his own specialized field; very often we have to look to one man to report on the engineering aspects and also on many of the other aspects as well. This fact explains how difficult it is for the Bank to find the kind of man it needs, and also why the Bank has to do a great deal of its own training. But that is another story.

What types of projects are the engineers of the Bank concerned with? The following examples can be considered as typical projects which the Bank is asked to assist in financing.



A recent loan of \$66 million was made to the Yanhee Electricity Authority in Thailand, an independent Government Agency, to assist in financing the first stage of the Yanhee multipurpose project. The project will operate for the development of electric power, for the reduction of floods and for irrigation and is the largest ever undertaken in Thailand and one of the largest of its kind in Asia. It consists of the construction of a thin arch concrete dam 500 feet in height on the Ping River in northwestern Thailand, a powerhouse with an initial installed capacity of 140,000 kilowatts, a switch yard and substations, and transmission lines to Bangkok with a total length of 650 miles. The total cost of the project is estimated at the equivalent of \$100 million.

Then there were the two loans totaling \$107 million which the Bank made to the privately-owned Tata Iron and Steel Company, Limited of India. This is the largest integrated steel mill in Asia and accounts for more than two-thirds of India's present steel production. The mill is situated at Jamshedpur, 150 miles west of Calcutta, and the company's own iron ore and coal mines are nearby. The company is engaged in doubling its steel ingot capacity to a rate of two million tons a year. In June 1956 the Bank made a loan of \$75 million for additions started in that year; the most recent loan will help the company to bring the entire modernization and expansion program to completion. All major installations should be operating by the end of 1958 and the full program should be completed in 1960 at a total cost equivalent to \$250 million. You will all understand how important it is to that part of the world to increase its steel production and thus provide a local source of supply to meet the rapidly growing demand for steel in Asia.

A third example was a smaller loan of \$7 million to the Aichi Irrigation Public Corporation, a Japanese Government Agency, which was formed



in October 1955 to plan and execute a program for irrigation, water supply and power in the Aichi region of central Japan. The program will make possible the production of about 200,000 tons of additional food crops annually, will supply drinking water to many towns and villages, provide more water for industry in three cities, including Nagoya, Japan's third most important industrial city, and increase the power supply of the region. The program is expected to take four years to complete, at a cost equivalent to about \$100 million. The Bank is participating in the project with a loan of \$7 million to pay for the importation of heavy earth moving equipment, the services of irrigation and construction consultants, and the training abroad of key personnel in the techniques of ridge-land irrigation. This will be Japan's first attempt to irrigate ridge-lands and experience gained in the Aichi region will demonstrate whether it will be feasible to use the same techniques on very much larger areas of similar land in southern Japan. If this is possible, the development at Aichi will have made an even more significant contribution towards improving Japan's food supply.

Down in Chile the two principal coal mining companies are the Schwager Company and the Lota Company. The two companies obtained loans from us last year totaling \$21,800,000 for the modernization and expansion of their mines about 300 miles south of Valparaiso. Both companies are opening new mines and had made considerable investments in sinking new shafts and installing some equipment before Bank loans were made. The total cost of the work to be undertaken in developing the two mines during 1957-62 is estimated at \$41.6 million. The Bank loans will provide most of the foreign exchange requirements and will pay for such imports as equipment for face and rock-work development, coal haulage installations and coal preparation plants. The projects being carried out with Bank assistance will enable the companies to increase production from a level of 1.7 million tons a year to 2.2 million



tens by 1964. To import this much coal would cost Chile \$40 million in foreign exchange annually.

Coming closer to home, in fact, to the Pacific coast of North America, we made a loan of \$61 million to Mexico's Pacifico Railroad, which runs down the northwest coast of Mexico from Arizona to Guadalajara. The agriculture of northwest Mexico had been expanding very rapidly in recent years due to the application of large-scale irrigation to coastal lands which had previously suffered from long droughts alternating with floods sweeping down from the Sierra Madre to the sea. Three million acres of irrigated land are under cultivation and this area is now being doubled. There are now heavy crops of cotton, corn, sugar cane, vegetables and fruit. In 1953 the railroad was in such a dilapidated condition that there were many train derailments and track speeds were as low as 6 miles per hour. The purpose of our loan was to finance a complete rehabilitation program based on a survey of the needs of the railroad as outlined by a U.S. firm of consulting engineers. By November 1957, new ballast had been applied to almost the entire length of the roadbed, the line had been relaid, the alignment had been improved and bridge and trestle repairs had been made. Over 1600 new steel boxcars were purchased and more than 60 diesel electric locomotives are in service, and a new telegraph communication system has been installed to handle modern railroad operations. Copper from Cananea near the U.S. border now makes the journey to Guadalajara in 8 days compared with 50 days previously and agricultural produce which took almost as long for the journey in 1952 now take about 3 days.

I should make it clear that it is the Bank's established practice not to finance the entire cost of any project or program. Our normal operation takes the form of a loan in foreign exchange to finance the foreign



exchange costs of the project. The borrowers must find other finance to meet local costs, for labor and so forth. In accordance with the Bank's Charter, expenditure of the loan is not tied to any particular source of supply; borrowers are free to use the proceeds to make purchases in any member country (and in Switzerland, which has a special relationship with the Bank).

It often happens that when we look at economic conditions in a borrowing country we find that some of the policies being pursued adversely affect the economic stability of the country, and that, if these continued, they would endanger both the productive purposes and the repayment prospects of a Bank loan. In such cases it is our policy to require, as a condition of our financing, the borrowing country to institute measures designed to restore stability.

There are other policies which may cause the Bank grave concern. For example, there is the widespread tendency to sell electric power so cheaply that the power companies, whether private or public, cannot operate on a sound business basis, still less provide for future expansion. Indeed, in many countries, after some years of these rate policies, they have good reason to accept the old saying that the most expensive kilowatt is the one you haven't got. The Bank, therefore, makes every effort to ensure that the prices to be charged for the end-product, whether it be power, steel or freight charges, will be adequate to meet all costs.

As has already been indicated, most of the Bank's loans are for such basic utilities as highways, railroads, power facilities, irrigation and reclamation projects -- which are essential foundations for the later development of private initiative in industrial, agricultural, mining and other undertakings.

In fact, the promotion of private enterprise is a central part of



our effort at the World Bank. We believe that governments should be fully occupied looking after those public services which governments must provide, and that they should not try, in addition, to carry on activities for which government operation is inappropriate. Our lending for industry has been almost entirely to private corporations, including both the private steel companies of India, the steel industry of Japan, paper manufacturers in Chile, cement producers in Peru, and so on. A great deal of our lending for electric power has been to privately-owned utility companies, and we are alert always for new opportunities to assist the private sector. This is a natural corollary of the fact that the great majority of the money we lend nowadays comes from private investors who lend their money to us and thereby increase the flow of private capital into international development. By and large the World Bank has had a successful beginning, both in terms of the success of the projects which it has helped to finance, and in commercial terms. We have now accumulated total reserves of more than \$360 million and our net earnings for the last fiscal year were over \$40 million. The more we can produce results of this kind, the more we can restore the confidence of private investors in overseas loans, provided they are well made and well administered.



ADDRESS BY GAIL A. HATHAWAY, ENGINEERING CONSULTANT,  
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT,  
BEFORE JOINT GROUP OF ENGINEERING SOCIETIES  
NORFOLK, VIRGINIA -- FEBRUARY 27, 1959

---



THE ENGINEER ABROAD

I appreciate the opportunity of appearing before this group, representing, as you do, many branches of the profession of engineering and of architecture. It is most appropriate that you should schedule your third joint dinner meeting during National Engineers Week, an observance which the National Society of Professional Engineers may proudly take credit for initiating. The technologist in a society based largely on group relations can well afford to dedicate one week of the year in a special effort to stimulate a better understanding on the part of the general public of the contributions which science and engineering have made to our way of life today.

Sometimes I feel that we speak rather loosely of a profession and a professional man. To possess and to practice a special skill, even of a high order, do not in themselves make an individual a professional man. What is the distinctive mark of the professional man? The late Dr. W. E. Wickenden, in an address entitled "The Second Mile", answered this question exceedingly well when he stated:

"First, we may say the professional man engages in a type of activity which carries high individual responsibility and which applies special skill to problems on a distinctly intellectual plane.

"Second, we may say that it is a motive of service, associated with limited rewards as distinct from profit.

"Third, is the motive of self-expression, which implies joy and pride in one's work and a self-imposed standard of excellent.



"And fourth, is a conscious recognition of social duty to be fulfilled among other means by guarding the ideals and standards of one's profession, by advancing it in public understanding and esteem, by sharing advances in technical knowledge, and by rendering gratuitous public service, in addition to that for ordinary compensation, as a return to society for special advantages of education and status."

It is probably fair to say that the large engineering societies of the country have been the greatest factor in developing the profession of engineering to its present status. The record of origination, stimulation and expansion of developments by the societies in the purely technical aspects of engineering is well known. However, there is less public recognition of their contributions toward development of professional consciousness among members of the profession, their insistence on the observance of ethical relations and practices and steps taken to guarantee to the public the trustworthiness of professional engineers. May I again state that the profession as a whole should continue to stimulate a greater understanding of the contributions of the engineering profession to society.

We are living in a century that has been marked by an unprecedented advance in man's understanding of nature. This advance has placed in the hands of mankind new sources of power and vast new possibilities for engineers and scientists.

At the same time the world's needs and the world's desires are increasing even faster. Almost every section of the globe is undergoing rapid economic expansion, generally with the greatest emphasis on industry. With these new developments have come new hopes and new outlooks. They have made possible new levels of productivity, higher standards of living, better health and more leisure.

Modern communications have brought the world closer together. With ever closer ties between nations and a greater recognition of their community of interest, the less developed countries are looking for the advice and experience



of the more developed countries to assist them with their economic expansion.

Although there are many features to be considered in accelerating the economic and social progress of a country, two of the more essential ones are capital and sound technical advice. This is not to minimize other important aspects such as economics, finance, basic resources, etc. In this regard, I should like to tell you something about the World Bank, which is now concerned primarily with the financing of productive projects in the less developed areas of the world, and the role of the engineers in connection with these projects. The fact is that the engineers associated with the World Bank are called upon not only to exercise their normal professional skills, but also to operate in the fields of finance, economics and even accountancy.

But first let me say a few words about the World Bank, in case some of you are not familiar with its functions.

The International Bank for Reconstruction and Development, generally referred to as the World Bank, began operations in 1946. It was set up as a channel for international investment to increase production, raise living standards and help bring about a better balance in world trade. The 68 member countries of the Bank are its stockholders, each subscribing to its capital stock in accordance with their economic strength. For example, the United States' contribution is \$3½ billion, or over 30%, and that of Panama is \$200,000, or less than .001%. The current authorized capital of the Bank is \$10 billion, of which \$9.5 billion has been subscribed by the 68 member countries. Of this amount, however, only 20% is paid in, partly in gold or dollars and partly in local currencies. The remaining 80% is subject to call only if required to meet the Bank's obligations. Actually, the Bank is a joint enterprise to which all member nations, including the less developed ones themselves, subscribe capital and pledge credit, and all 68 nations, borrowers and lenders alike, have a voice.

The Bank is not only a lender but also a borrower, since the capital



subscribed by its member governments was never intended to finance all of its operations. Although the Bank has made loan commitments totaling about \$4.3 billion, it has used or allocated only the equivalent of \$1,400 million from government subscriptions. It has drawn a much larger sum, equivalent to \$1,800 million, from the sale of its bonds in the capital markets of the world. The remainder of the Bank's lending funds has come from earnings, from repayments, and from the sale of parts of its loans to other investors.

I feel that at this point it is important to emphasize that currently the major source of the Bank's investment capital comes from private investors who lend their money to us and thereby increase the flow of private capital into international development. To continue lending at the present rate the Bank will have to borrow on a greater scale than before. It is for this reason that the Executive Directors of the Bank, on December 22, 1958, recommended to the Board of Governors a major increase in the Bank's capital in order to strengthen its capacity to borrow funds for financing economic development in its member countries. The Board of Governors is made up of one representative, usually the Finance Minister, of each of the Bank's 68 member countries.

Under the proposal, authorized capital would be increased from \$10 billion to \$21 billion, provided that members subscribed \$7 billion of new capital by September 15, 1959. This increase would permit member governments to double their present capital subscriptions and would still leave a margin of unsubscribed capital for admission of new members and for possible increases in individual subscriptions.

No cash payments would be made to the Bank. The new subscriptions would be left subject to call. The effect in the case of the United States would be to increase the amount of its subscription left subject to call from the present figure of \$2,540 million to \$5,715 million.

In addition, certain further increases in subscription are proposed for



three countries, Canada, Germany and Japan, whose economic strength has grown markedly in the post-war period.

By February 2nd of this year all our member governments had given preliminary approval to this doubling of the Bank's capital, and it looks as if the increase will be fully effective by September.

The Bank has already made 225 loans in 49 countries, totaling almost \$4.3 billion. About a third of the Bank's development lending has been for electric power and has helped to finance the addition of eight million kilowatts to the world's generating capacity -- more than the total generating capacity existing in the whole of Latin America at the end of World War II. Another third of our lending has been for transport movement -- railways, highways and ports, of which I shall have more to say later on. The remaining third of the Bank's loans has been for agriculture, especially irrigation; for industry, especially steel production; and for general development purposes.

In making its loans the Bank is obliged by its Charter to pay "due regard to the prospects that the borrower, and, if the borrower is not a member, that the guarantor, will be in a position to meet its obligation under the loan"; the Charter further requires the Bank to act "prudently" in the interests both of the borrowing country and of the members as a whole. In any case, even if this provision did not exist the Bank could not endure as a continuing institution, operating on a sound business basis and with funds borrowed in the private market, if it did not take care to make loans only where there are reasonable prospects of repayment.

First of all, we have to decide whether the would-be borrowing country is in a position to borrow at all. This involves an examination of the existing debt burden of that country, the schedule of service payments over the following period of years, the likely earnings of foreign exchange over the period of the loan, and so forth. There are some countries in the world which are not



economically viable, which exist through the generosity of one or more of the richer nations. In such cases as this the World Bank does not embark upon a lending program. On the other hand, the majority of countries are in a position to undertake some further debt and the Bank has to make a careful and conservative assessment of the ceiling or upper limit which it thinks it could prudently lend.

The assessment of repayment prospects also requires us, of course, to evaluate the effectiveness of the government administration and of the business community, the availability of managerial, supervisory and technical skills, the scale and character of investment, and the economic and financial policies which are likely to be followed, particularly as they affect the level of domestic savings and the flow of foreign private capital.

To do the most good our investments must be devoted to those undertakings which will contribute most to strengthening the economy of the borrowing country. The situation in each country must be considered on its own merits.

The relative profitability of different projects is frequently not a sufficient test of their respective contributions to a country's development. In many cases, certain basic investments in public utilities, transportation and ports, flood control, irrigation and similar projects are required before other investments can be undertaken. The indirect benefits arising from these basic investments may be very great even though the direct earnings, at least in the short run, are not high or may even be non-existent. For example, a highway system, unless it involves toll roads, yields no direct revenue but it may foster all kinds of industrial and agricultural activity.

Deciding on the priority of the project is, of course, only a first step. The Bank also needs to assure itself that the technical, financial and administrative plans for the project are satisfactory. These points often involve investigation, study and negotiation over a broad field. For example, we have to



be satisfied that the engineering plans have been competently drawn, that the project is suitably designed, and that construction will be entrusted to competent hands and will be properly supervised. In making the necessary preparations for a successful project we believe that considerable advantages can often be obtained if the borrower calls in consultants for the planning, design and supervision of construction.

In connection with the employment of consulting engineers for the projects the Bank is helping to finance, it is our policy to leave their selection to the borrower. The Bank must, of course, be satisfied that the firms appointed have had satisfactory experience on comparable projects, that the staff to be assigned to the particular work are qualified and that the terms of reference under which they are employed are such as to assure satisfactory execution of the project.

The Bank also relies heavily upon the advice of the engineering specialists on its own technical staff. These specialists are members of the Department of Technical Operations which has the responsibility of assessing the merits of projects proposed to the Bank for financing; recommends to the Management of the Bank the amount, duration and special conditions of each loan, and follows the progress of projects financed with the help of the Bank. The Department is divided into four divisions corresponding to the four main types of projects financed: Public Utilities, especially electric power; Transportation; Industry and Agriculture. All of the engineers employed by the Bank are assigned to the Department of Technical Operations, which has a total staff of about 100 persons, of which 30 are engineers, 16 are financial analysts, 11 are economists and 5 are agriculturists. This professional staff of 16 different nationalities works together as a team.

As you will have already realized, the operations of the Bank are not only large, they are also extensive. We have projects to visit and supervise in 49



different countries on six continents. It is a case of "have Bank -- will travel". We have to report on future projects, on those under construction, and also on projects already completed, of whose effectiveness the Bank wishes to be informed. Obviously, in this situation none of the Bank's engineers can be a narrow specialist. He has to be able to cover a good deal of ground, in every sense of the word. But that is not all. As I have just said, the Bank looks to the Technical Operations Department for advice on the financing of the loan, involving the Department in scrutiny of construction progress, operating efficiency, balance sheets, cash flow, and all sorts of other things. We are not in a position to send large numbers of people round the world, each asking the questions that lie in his own specialized field; very often we have to look to one man to report on the engineering aspects and also on many of the other aspects as well.

For example, let's take a look at the Bank's lending for the construction or expansion of various ports around the world. Many of the members of the engineering profession residing in this area are also concerned with port problems and you may be interested in typical projects of this type which the Bank has been asked to assist in financing.

A recent loan of \$14 million was made to the Trustees of the Port of Madras, India. The borrower is an autonomous authority which operates the Port of Madras subject to the general control of the Government of India. The project provides for the modernization and expansion of the port so that it can handle four million tons of traffic annually, or half again as much as current traffic.

The main improvements being undertaken include the construction of a new ship basin large enough to accommodate six new berths, of which only two will be fully equipped initially; construction of two other new berths, one for handling coal and the other for ore; reconstruction and re-equipping of two general cargo berths, improvement of a third berth to accommodate both passengers and cargo;



the building of a new railroad marshalling yard, new transit sheds and other buildings; acquisition of modern cargo-handling equipment and of additional floating craft. The total cost of the project is expected to be equivalent to \$32.2 million; the Bank's loan of \$14 million will cover the foreign exchange requirements.

Madras, on the southeast coast, is the third largest port of India, now handling over 2½ million tons of traffic annually. Since the war, the number of ships using the port has increased by 30%. Bulk exports of manganese ore have grown to almost half a million tons a year, and imports of general cargo have risen markedly, especially iron and steel, machinery, chemicals and fertilizers. The Port of Madras is being expanded to accommodate the expected growth in traffic for the next ten years or more.

An example of a rather unusual project involved a transport loan of \$4.8 million to the Belgian Trust Territory of Ruanda Urundi, a small territory which lies in the middle of Africa between the Congo and Tanganyika. The loan was made for construction of a modern port on Lake Tanganyika at Usumbura, the capital of Ruanda Urundi, and the building of 25 miles of paved highway from Usumbura up to the central plateau. The port works to which the Bank's loan will be applied consist of two quays built around an interior basin with breakwaters to protect the entrance from the waves caused by the prevailing southwesterly winds. The new highway will be built to replace the worst and most difficult stretch on the Usumbura-Kigali road, the main artery between the port and the central plateau where most of the population and economic activity are concentrated.

The two projects form a vital link between Ruanda Urundi and the rest of the world. Most of the exports and imports of the country pass through the port of Usumbura, the volume reaching about 200,000 tons in 1956. The replacing of inadequate and obsolete facilities by a modern port will expedite the movement



of goods, reduce costs and provide for growing traffic. The bulk of the coffee and minerals, the Territory's chief exports, are produced on the plateau and are brought down the highway by truck for shipping through the port of Usumbura. Mind you, when the exports are put aboard at the new port, they are still 800 miles from the nearest ocean.

A third example was a loan of \$13 million for the construction of a new port at Guayaquil, Ecuador, largest city and main port. The loan was made to the Guayaquil Port Authority, an autonomous agency created in April 1958 to operate the existing port and to construct and operate the new one. The new port will enable bigger ships to reach Guayaquil, cut down turnaround time, and reduce the need for lighterage. This will lead to substantial savings, and will allow a growing volume of trade to be handled without congestion.

The Port of Guayaquil is located at the point where the Daule and Babahoyo Rivers meet, 55 miles from the sea, to form the Guayas River. A ferry across the Guayas River connects the port with Duran, terminal of the railway that winds up through the Andes to Quito, the capital, and other cities of the temperate Sierra. Goods carried by this railway formerly accounted for most of the traffic to and from the port. But in recent years the remarkable rise in Ecuador's banana exports -- once negligible but now largest in the world -- has led to an increase of traffic on the Daule-Babahoyo waterway system, and on a network of highways built in the Guayas Province with the help of an earlier Bank loan.

Guayaquil handles about 90% of Ecuador's import volume and 60% of its exports. In line with the recent economic growth, the volume of exports passing through the port has risen by 70% since 1953. The main exports are bananas, coffee, cacao, sugar, rice, balsa and fish. Imports consist chiefly of iron and steel, cars and trucks, machinery and wheat.

The project includes the construction of a concrete wharf 3,000 feet long and capable of accommodating five ships at a time. The area behind the new wharf



at present swampy and unuseable, will be reclaimed, and transit sheds and other buildings will be erected. Some cargo-handling equipment will be transferred from the old to the new port, but additional equipment necessary for efficient operation will be purchased with Bank funds. The total cost of the project is the equivalent of \$19.1 million, of which \$13 million will be in foreign currency and will be covered by the Bank's loan.

It is estimated, on the basis of present traffic alone, that the completion of the new port will reduce handling charges by the equivalent of more than \$500,000 annually and the reduction in turnaround time will result in a further saving equivalent to about \$1.5 million annually.

I should make it clear that it is the Bank's established practice not to finance the entire cost of any project or program. Our normal operation takes the form of a loan in foreign exchange to finance the foreign exchange costs of the project. The borrowers must find other finance to meet local costs, for labor and so forth. In accordance with the Bank's Charter, expenditure of the loan is not tied to any particular source of supply; borrowers are free to use the proceeds to make purchases in any member country.

The same is true of engineering services. The borrower may choose his own consultants who, of course, report to the borrower and not to the Bank. Naturally, we are very much interested in the quality of the engineers who design the projects which we help to finance, and our job is very much affected by the thoroughness with which our borrowers' consultants do their work. As will have been clear from all that I have said, the Bank's operations are concerned very largely with large public works projects in the less developed countries of the world, countries which have no industrial inheritance and very little knowledge of or experience with modern engineering and construction techniques. In these circumstances, the efficient design, construction and



operation of a project often requires that competent engineers be imported from the industrialized countries. The Bank goes in for a great deal of persuasion to this end, and often it encounters resistance by the less developed countries which are reluctant to spend what seems to them very large sums on importing engineering talent. Indeed, in some cases, it is necessary for the Bank to refuse to make a loan unless competent engineers are employed from abroad. We do all this, of course, for the sake of our member countries, and not necessarily for the sake of the world's engineering profession. Nonetheless, the profession does gain a great deal as a result of our efforts. In fact, of the \$500 million a year which we are now disbursing on our loans, a significant proportion is spent on the employment of consulting engineers.

In addition, of course, the Bank itself occasionally runs into problems which are beyond the experience of our own engineers. In such cases we employ consultants to advise us, and are currently spending over \$200,000 a year on the employment of outside consultants. This is only a fraction, of course, of what our borrowers are spending.

In the kind of projects we are helping to finance we do not encourage our borrowers to employ consultants who double as contractors. We have no blanket rule against package deals; in some circumstances they may be the best way to tackle a project, but they do tend to eliminate competition where it can be a healthy force, and we feel that on large public works projects the borrower will obtain better judgments from consultants who do not have a vested interest in the actual construction contract or in the supply of some particular type of equipment.

Should you engineers take assignments in less developed countries, you will be faced, as many know quite well, with an entirely new environment in which to work. The language, culture and traditions will be different. Likewise, climatic conditions, as well as health standards do not compare with those that



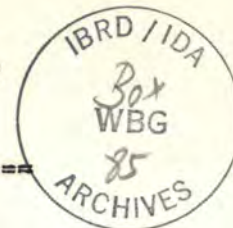
you are accustomed to. Generally speaking, there will be no middle class and little or no skilled labor. Statistical and technical data will be lacking, and construction in many cases will proceed at a much slower pace than that to which you are accustomed. But when you become used to this new environment, the impact that you will be capable of making will be significant and worthy of the challenge.

In the light of all this, I can assure you that the World Bank is one institution which values the contribution made to world progress by the engineering profession. In fact, the Bank stands ready to support all efforts made by engineers to enhance public recognition of the profession.



ADDRESS BY GAIL A. HATHAWAY, ENGINEERING CONSULTANT  
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT  
BEFORE THE NATIONAL WATER RESOURCES INSTITUTE  
LINCOLN, NEBRASKA -- MARCH 18, 1959

---



THE INTERNATIONAL DEVELOPMENT OF WATER RESOURCES

It is a great privilege, Mr. Chairman, to be invited to participate in the 1959 program of the National Water Resources Institute. The need for coordinated effort toward a greater development of water resources and improved utilization of their potentials in an integrated economic policy setting is becoming increasingly urgent. Already, in many areas of the world, water supplies are proving inadequate to meet growing demands, and it is most timely and appropriate that your Institute should provide a forum where this important subject can be discussed.

Fortunately, I have had the opportunity to become quite familiar with the water resources of the Missouri River Basin and have followed with great interest the development of these resources over the past thirty years. In fact, I spent nine years in Kansas City, Missouri studying the water resources of the Missouri River Basin. First, I was with the District Office of the Corps of Engineers, helping to carry out investigations and prepare reports to Congress on the development of these resources, and then I was transferred to the newly-created Missouri River Division Office and participated in the planning and design of the Fort Peck project.

These nine years in Kansas City were extremely profitable from my own personal viewpoint because of the valuable engineering experience obtained during the great depression of the thirties when many engineers were unemployed. Moreover, I was occupied with work that required firsthand knowledge of a great river basin that covers almost one-fifth of the area of the United States. On the other hand, I recall quite well certain other events that one could not very well forget; for example, the prompt dismissal of a close friend of mine, a Sergeant on the Kansas City Metropolitan Police Force, who made the mistake on election day of marking conspicuously with mercurochrome a large number of



the north end "Skid Row Hunkies" to prevent them, after casting their first vote, from repeating the performance in other wards of the city. Then there was the warm spell, to put it mildly, in Kansas City in July 1934 when the daily maximum temperature exceeded 100 degrees for 14 consecutive days, the highest temperature reaching 110 degrees on July 24th. "Old Sol" did not want to slight the capital of the great state of Nebraska, so he provided the citizens of this lovely city with 15 consecutive days when the thermometer registered above 100 degrees, reaching a maximum on July 15th of 112 degrees.

I also remember the frequent dust storms of that period, particularly the one that occurred on November 12, 1933 which probably covered the greatest area of record. The storm involved an area in the United States from the Canadian line -- Lake Superior to Montana -- southward to the western Ohio and lower Missouri Valleys, a region of greater extent than the combined areas of France, Italy and Hungary. Visibility was low and artificial lights were required during the day. Barometric gradients were such as to cause winds of gale force over the northern and central Great Plains. Owing to the severe drought all crops, including pasture grass and hay, had failed over vast areas in the middle west, a condition that served to accentuate the dense clouds of dirt and dust. Houses well built with tight windows, weather-stripped and with storm sash, could not keep out the unwelcome entrance of fine, powder-like dust. Every home and building had to be cleaned from basement to roof. Spectacular becomes a weak adjective when applied to the great dust storm of November 12, 1933.

Much has been done in the Great Plains area during the last two decades to alleviate future dust storms by modern soil conservation practices. Most of the water resources projects that we recommended in the Corps of Engineers



Reports have been completed, and I might add that other projects that did not appear feasible during the initial planning stages for the comprehensive development of the water resources of the Missouri River have been completed, or are under construction. And, of course, more will follow in due course.

We are living in a century that has been marked by an unprecedented advance of man's understanding of nature. At the same time the world's needs and the world's desires are increasing even faster. Almost every section of the globe is undergoing rapid economic expansion, generally with the greatest emphasis on industry. With these new developments, and many are water resource developments, have come new hopes and new outlooks. They have made possible new levels of productivity, higher standards of living, better health and more leisure.

Modern communications have brought the world closer together. With ever closer ties between nations and a greater recognition of their community of interest, the less developed countries are looking for the advice and experience of the more developed countries to assist them with their economic expansion. Although there are many factors to be considered in accelerating the economic and social progress of a country, two of the more essential ones are investment capital and sound technical advice. This is not to minimize other important aspects such as economics, finance, basic resources, etc. The International Bank for Reconstruction and Development, generally referred to as the World Bank, is an international investment institution that is concerned primarily with the financing of productive projects in the less developed areas of the world.

I should like to describe a few of the comprehensive water resource development projects that the Bank is helping to finance, but first let me say a few words about its organization and functions.



The World Bank began operations in 1946. It was set up to increase production, raise living standards and help bring about a better balance in world trade. The 68 member countries of the Bank are its stockholders, each subscribing to its capital stock in accordance with their economic strength. For example, the United States contribution is  $\$3\frac{1}{2}$  billion, or over 30%, and that of Panama is \$200,000 or less than .002%. The current authorized capital of the Bank is \$10 billion, of which \$9.5 billion has been subscribed by the 68 member countries. Of this amount, about \$1,800 million is paid in and the rest is subject to call. Actually, the Bank is a joint enterprise to which all member nations, including the less developed ones themselves, subscribe capital and pledge credit, and all 68 nations, borrowers and lenders alike, have a voice.

The Bank is not only a lender but also a borrower, since the capital subscribed by its member governments was never intended to finance all of its operations. Although the Bank has made loan commitments totaling about \$4.3 billion, it has used or allocated only the equivalent of \$1,400 million from government subscriptions. It has drawn a much larger sum, equivalent to \$1,800 million from the sale of its bonds in the capital markets of the world. The remainder of the Bank's lending funds has come from earnings, from repayments, and from the sale of parts of its loans to other investors.

I feel that at this point it is important to emphasize that currently the major source of the Bank's investment capital comes from private investors who lend their money to us and thereby increase the flow of private capital into international development. To continue lending at the present rate, about \$700 million during the past year, the Bank will have to borrow on a greater scale than before. It is for this reason that the Executive Directors of the Bank, on December 22, 1958, recommended to the Board of Governors a major



increase in the Bank's capital in order to strengthen its capacity to borrow funds for financing economic development in its member countries.

The recommended increase would permit member governments to double their present capital subscriptions and would add a bit more of unsubscribed capital to allow for admission of new members and for possible increases in individual subscriptions. In all, the authorized capital of the Bank would increase from 10 to 21 billion dollars.

No cash payments would be made to the Bank. The new subscriptions would be left subject to call. The effect in the case of the United States would be to increase the amount of its subscription left subject to call from the present figure of \$2,540 million to \$5,715 million.

By February 2nd of this year all our member governments had given preliminary approval to this doubling of the Bank's capital, and it looks as if the increase will be fully effective by September.

The Bank has already made 225 loans in 49 countries, totaling almost \$4.3 billion. About a third of the Bank's development lending has been for electric power and has helped to finance the addition of eight million kilowatts to the world's generating capacity -- more than the total generating capacity existing in the whole of Latin America at the end of World War II. Another third of our lending has been for transport movement -- railways, highways and ports. The remaining third of the Bank's loans has been for agriculture, especially irrigation; for industry, especially steel production; and for general development purposes.

In making its loans the Bank is obliged by its Charter to pay due regard to the prospects that the loan will be repaid. The Charter further requires the Bank to act "prudently" in the interests both of the borrowing country and of the members as a whole. In any case, even if this provision did not exist,



the Bank could not endure as a continuing institution, operating on a sound business basis and with funds borrowed in the private market, if it did not take care to make loans only where there are reasonable prospects of repayment.

First of all, we have to decide whether the would-be borrowing country is in a position to borrow at all. This involves an examination of the existing debt burden of that country, the schedule of service payments over the following period of years, the likely earnings of foreign exchange over the period of the loan, and so forth. There are some countries in the world which are not economically viable, which exist through the generosity of one or more of the richer nations. In such cases as this the World Bank does not embark upon a lending program. On the other hand, the majority of countries are in a position to undertake some further debt and the Bank has to make a careful and conservative assessment of the ceiling or upper limit which it thinks it could prudently lend.

To do the most good our investments must be devoted to those undertakings which will contribute most to strengthening the economy of the borrowing country. The situation in each country must be considered on its own merits.

The relative profitability of different projects is frequently not a sufficient test of their respective contributions to a country's development. In many cases, certain basic investments in public utilities, transportation and ports, flood control, irrigation and similar projects are required before other investments can be undertaken. The indirect benefits arising from these basic investments may be very great even though the direct earnings, at least in the short run, are not high or may even be non-existent. For example, a highway system, unless it involves toll roads, yields no direct revenue but it may foster all kinds of industrial and agricultural activity.



Deciding on the priority of the project is, of course, only a first step. The Bank also needs to assure itself that the technical, financial and administrative plans for the project are satisfactory. These points often involve investigation, study and negotiation over a broad field. For example, we have to be satisfied that the engineering plans have been competently drawn, that the project is suitably designed, and that construction will be entrusted to competent hands and will be properly supervised. In making the necessary preparations for a successful project we believe that considerable advantages can often be obtained if the borrower calls in consultants for the planning, design and supervision of construction.

In connection with the employment of consulting engineers for the projects the Bank is helping to finance, it is our policy to leave their selection to the borrower. The Bank must, of course, be satisfied that the firms appointed have had satisfactory experience on comparable projects, that the staff to be assigned to the particular work are qualified and that the terms of reference under which they are employed are such as to assure satisfactory execution of the project. The Bank also relies heavily upon the advice of the engineering specialists on its own technical staff.

As you will have already realized, the operations of the Bank are extensive. We have projects to visit and supervise in 49 different countries on six continents. We have to report on future projects, on those under construction, and also on projects already completed, of whose effectiveness the Bank wishes to be informed.

Probably the most outstanding example of a comprehensive water resource development project which the Bank is helping to finance is located in the Damodar Valley in southeast India. Seven Bank loans, totaling \$210 million,



have contributed directly to a remarkable transformation that has taken place over the last decade in the Damodar Valley. The Damodar River drains a basin extending northwestward some 340 miles from its junction with the Hooghly River near Calcutta. This relatively small area, with its population of five million, has long been one of the richest agricultural areas of India. Over recent decades it has also become the heart of India's industry and one of the greatest manufacturing centers of Asia. The Damodar Valley area provides almost all of India's iron and copper and three-quarters of its coal, mica and chromite. Most of the steel, chemical, fertilizer, machinery and other heavy industries, as well as a wide variety of light and small-scale industries including cable, glass, ceramic and bicycle manufacture, have grown up in the Valley.

Until the present decade the way to the full realization of the economic possibilities of the Valley had been barred by the sudden monsoon storms which have always exposed the Damodar Valley to the danger of flash floods; the river has been known to rise as much as five to ten feet in a few hours. Attempts to abate this danger have been going on for a century or more, but a disastrous flood occurred as recently as 1943, when much of the countryside was under six feet of water and even Calcutta was in danger.

The Damodar Valley Corporation, which celebrates its eleventh anniversary this year, was set up with the object of putting the waters of the Valley to productive use. The Bank began lending to the Corporation in April 1950, when a loan was made to help finance a dam and a large new thermoelectric power station. A second loan was made in January 1953 for flood control, irrigation structures and further power installations.

The Corporation has already completed four large multipurpose dams -- three of them, Maithon, Panchet Hill and Konar, with the assistance of the



Bank. These four dams will go far toward eliminating the danger of flood, and in fact only last September, at a time of record high water, prevented what would have been a devastating flood. The Maithon and Panchet Hill dams feed water to the Durgapur barrage, another Bank-assisted project, which is now bringing the benefits of irrigation to 200,000 acres in the lower valley. In coming years, as more irrigation canals are completed, the area irrigated will be extended to one million acres; yields will be much increased and about a third of the area will be able to raise two crops a year instead of one.

These dams are also making a substantial contribution to the electric power resources of the Valley. The installation of 60,000 kilowatts of capacity at the Maithon dam is nearing completion; 154,000 kilowatts had already been installed by the Corporation in other parts of the Valley. With these plants in operation nearly all the hydroelectric potential of the Valley is now in use. Future power requirements will therefore be met by thermal stations, for which coal is abundant and inexpensive, and the Bank is financing two such stations in the Valley.

In the meantime, the industrialization of the Valley has been making rapid progress, both in heavy steel production -- for which the Bank has lent \$160 million -- and in manufacturing industry. As a result, extensive as the additions to power capacity have been, the total demand has already reached and surpassed the generating capacity of the system, and is expected to rise to nearly three times its present figure within the next four years.

Two other outstanding examples of water resource development projects will be of interest; the first an internationally financed operation which enabled the new Federation of Rhodesia and Nyasaland to construct the first stage of the Kariba hydroelectric power scheme, on the Zambezi River downstream



from Victoria Falls in central Africa. The finance arranged for was \$225 million, a very large commitment for a newly developing economy such as that of the Federation. The Bank's own loan of \$80 million, just over one-third of the total cost, is the largest the Bank has made in Africa and is the largest it has made for a single project. The first stage involved the construction of a dam to store 130 million acre feet, four times that of Hoover Dam, and the installation of 600,000 kilowatts of capacity, or half the power potential; a second power house and additional generators would be installed in later stages.

The second is a multipurpose project on the Ping River in northwestern Thailand for flood control, irrigation, navigation and the ultimate development of 560,000 kilowatts of electric power. The total cost of the first stage of the project is estimated at the equivalent of \$100 million and the Bank's loan of \$66 million will pay for imported equipment, materials and service.

There are other large underdeveloped resources of water in Africa and Asia. I should like to tell you about two of them: One is the Mekong River Basin in southeast Asia and the other is the Congo in Central Africa.

The headwaters of the Mekong are in Tibet and China, some 2,600 miles to the north of the point where the river empties into the South China Sea near Saigon in southern Viet-Nam. Its drainage area of <sup>307,000</sup>~~30,700~~ square miles is small when compared to that of the Mississippi, but the development problems are far more complex. The countries of Tibet, China, Burma, Laos, Thailand, Cambodia and southern Viet-Nam have riparian rights.

There is a dearth of hydrologic and meteorologic data in the basin, and arrangements have only recently been completed for a five-year integrated and



coordinated program for obtaining basic resource data. The river has only been used for navigation and for some small irrigation projects along its banks. There is no power developed on the river; in fact there is not a man-made structure along its whole length, not even a bridge, <sup>except possibly in the headwaters.</sup> The Mekong and its tributaries do not lack for suitable sites for future development, but design of the projects should be based on adequate and reliable data. The preparation of a comprehensive plan for the ultimate development of the water resources of the basin demonstrates the need for, and importance of, cooperation and coordination at the international level.

Unlike the Mekong, much more is known about the resources of the Congo River. It is the second largest river in the world. The drainage basin encompasses all of the Belgian Congo, Africa's richest colony, which may in the not too distant future become one of the world's important industrial nations. At the present time the Congo exports 75% of the world's industrial diamonds, leads the world in cobalt, is fourth in tin, twelfth in gold, has large amounts of uranium ore and just recently extensive deposits of bauxite have been discovered near the mouth of the Congo.

The Congo's potential hydro power is enormous. Attention has been attracted recently to the Belgian Government's plan to build the Inga Falls project located on the Congo River, a short distance upstream from its mouth. The drainage area above the site is 1,450,000 square miles. The Congo has a remarkably uniform flow, varying between 800,000 and 2.2 million cubic feet per second. The gross head for the ultimate development would be over 400 feet with an installation of about 28 million kilowatts. The magnitude of the project is realized when compared with the total of all of the <sup>existing</sup> hydro-electric developments in the United States, which is less than 28 million kilowatts.



The project would be developed in stages, the first stage power to be sold for about 2.5 mills per kilowatt-hour, and when the project is finished the price would drop to 1.2 mills per kilowatt-hour.

The Inga Hydroelectric Scheme is a sound project from an engineering point of view, and will, when developed, provide very low-priced energy in <sup>large</sup>~~low~~ blocks. However, the real problem is to find the most advantageous market, or means of disposing of such large blocks of power.

The newly established United Nations Special Fund which started operation on January 1, 1959 is of particular importance in connection with the initiation of international water resource projects in the less developed areas of the world. The program is under the direction of Paul G. Hoffman, former President and Chairman of Studebaker Corporation and the first Administrator of the Marshall Plan. The program will concentrate on the removal of bottlenecks and other obstacles that have been retarding the progress of a country or a region, such as the lack of comprehensive surveys in depth of natural resources, manpower, skills and industrial potentials which would create a solid basis for future advancement. Their initial program puts major emphasis on projects that would demonstrate the wealth-producing potential of unsurveyed natural resources in the less developed countries; on training and research institutes; and on surveys of limited costs which would lead to early investment.

The functioning of the United Nations Special Fund is dependent upon contributions from the 88 Governments eligible to participate in the Special Fund. It is contemplated that between \$20 and \$30 million will be available to the Special Fund for allocation during the 1959 calendar year.



In conclusion, I suggest that we reflect on how economic development took place during the 18th and 19th Centuries in the United States. I need not remind you that we were once an underdeveloped country. It is true that much of our success was due to the immense natural resources of our vast continent and the initiative and skill of our forefathers. However, this was not the entire reason for our success. During the periods of greatest development in the United States, Europeans invested vast sums in railroads, factories and enterprises of all kinds, amounting at times to as much as 10% of our entire national income.

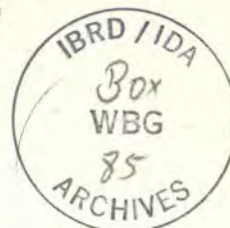
In those days, virtually all international investment was made from private sources for private profit. In our own time, the problems are bigger and more complicated, and public institutions like some of those I have mentioned play a necessary and useful role. Among such institutions, the Bank perhaps is unique: as I have indicated, it not only draws a large part of its loan funds from the private market, but it acts entirely on the basis of loans made according to business standards.

We have had a successful beginning, both in terms of success of the projects financed and in commercial terms. We have now accumulated total reserves of more than \$385 million and our net earnings for the last fiscal year were over \$40 million. The more we can produce results of this kind, the more we can restore the confidence of private investors in overseas loans, provided they are well made and well administered.



ADDRESS BY GAIL A. HATHAWAY, ENGINEERING CONSULTANT,  
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT,  
BEFORE SEMI-ANNUAL MEETING OF  
CONSULTING ENGINEERS COUNCIL,  
CINCINNATI CLUB, CINCINNATI, OHIO  
NOVEMBER 6, 1959

---



THE WORLD BANK AND ITS RELATIONS WITH CONSULTING ENGINEERS

I appreciate the opportunity, Mr. President, of participating in the program of your 1959 Semi-Annual Meeting. First of all, I should like to compliment the members of Consulting Engineers Council on the organization's growth and accomplishments during a period of a little over three years. You have grown from ten Member Associations, representing about 500 engineers, to twenty Member Associations, representing over 1400 engineers in private practice.

Although the Council was established to promote the professional and economic welfare of the independent consulting engineer engaged in private practice, your "Code of Ethics" and "Objects and Purposes" contain all of the earmarks of a truly professional organization. One may ask what is the definition of a profession -- an attitude of mind; a certain kind of work requiring special skill on a high intellectual plane; a special order in society, as the bar, the bench or the clergy; or is it work requiring a confidential relationship between a client and his agent, as that of a patient to physician, litigant to lawyer; etc. I do not believe that any of these definitions taken alone provide the answer, but taken together they give a profession a stable base of support. However, to be strong and effective a profession or a professional organization must count on its rosters a substantial group of professional men whose intellectual attainments far exceed in depth and breadth the technical demands of its practice.

What is the distinctive mark of the professional man? To possess and to practice a special skill, even of a high order, do not in themselves make an



individual a professional man. The late Dr. W. E. Wickenden, in an address entitled "The Second Mile", answered this question exceedingly well when he stated:

"First, we may say the professional man engages in a type of activity which carries high individual responsibility and which applies special skill to problems on a distinctly intellectual plane.

"Second, we may say that it is a motive of service, associated with limited rewards as distinct from profit.

"Third, is the motive of self-expression, which implies joy and pride in one's work and a self-imposed standard of excellence.

"And fourth, is a conscious recognition of social duty to be fulfilled among other means by guarding the ideals and standards of one's profession, by advancing it in public understanding and esteem, by sharing advances in technical knowledge, and by rendering gratuitous public service, in addition to that for ordinary compensation, as a return to society for special advantages of education and status."

In many respects there is a striking similarity between Dr. Wickenden's description of the distinctive mark of the professional man and your "Code of Ethics", "Objects and Purposes" and the short preamble on the first page of the Council's 1958-59 Yearbook entitled "As a Consulting Engineer, I Believe, I Owe, The World Owes Me". I need not point out to this group the importance of the relationship between the engineer and his profession. The engineer, in a society based largely on group relations, needs his profession to safeguard his occupational and economic welfare. He needs protection against unethical competition as well as protection against all influences which might undermine public confidence in his integrity and competence. The founders of Consulting Engineers Council have prepared a solid foundation for future expansion and the accomplishments over the past three years have been truly remarkable.



We are living in a century that has been marked by an unprecedented advance in man's understanding of nature. This advance has placed in the hands of mankind new sources of power and vast new possibilities for engineers and scientists.

At the same time the world's needs and the world's desires are increasing even faster. Almost every section of the globe is undergoing rapid economic expansion, generally with the greatest emphasis on industry. With these new developments have come new hopes and new outlooks. They have made possible new levels of productivity, higher standards of living, better health and more leisure.

Modern communications have brought the world closer together. With ever closer ties between nations and a greater recognition of their community of interest, the less developed countries are looking for the advice and experience of the more developed countries to assist them with their economic expansion.

Although there are many features to be considered in accelerating the economic and social progress of a country, two of the more essential ones are capital and sound technical advice. This is not to minimize other important aspects such as economics, finance, basic resources, etc. Needless to say, consulting engineers have played the major role in providing sound technical advice for the less developed countries throughout the world. Many United States consulting engineering firms are now doing work abroad and at times are faced with problems that should properly be handled by an international organization such as the International Federation of Consulting Engineers (FIDIC), of which Consulting Engineers Council is now the United States member. Acceptance of membership in FIDIC also includes the responsibility as spokesman for U.S. consultants on an international level. Later I should like to bring to your attention some of the problems of consultants in the international field, but first may I talk about the World Bank, which is now concerned primarily with the



financing of productive projects in the less developed areas of the world.

At the outset, let me stress that the Bank is a cooperative organization. It is owned and capitalized by its 68 member countries; it operates for the benefit of public and private enterprises in the territories of these 68 countries. This means that we do not lend in the Soviet Union, its satellite countries or in Communist China, since none of these is a member of the Bank.

Each country provides finance to the Bank according to its own economic strength. The biggest stockholder in the Bank, as you would expect, is the United States. The United States holds about 30 per cent of the capital stock of the Bank; its actual payment on capital stock amounts to \$635 million. The smallest stockholder in the Bank, incidentally, is Panama, which has paid in \$40,000.

The Bank, however, does not rely entirely -- or even mostly -- on government capital for the money it lends. The American capital payment, for instance, was completed as long ago as 1946. Something more than half the Bank's loan funds have, in fact, been raised not from governments but by selling the Bank's bonds and notes to other investors throughout the world.

The Bank has had about a billion and a half dollars from government subscription. It has had over two billion from the sale of securities to investors; and it is these sales to which the Bank is looking for most of its funds from now on. Already, the bonds of the Bank are among the most widely accepted securities in the world. We have sold them in more than 40 countries, for dollars, pounds, guilders, francs and marks.

Some of you may have noticed a month or so ago the statement by President Eisenhower urging other countries to help take up the economic burdens which for so long have been borne primarily by the United States. The World Bank, I may say, is one place where this is already being done. Taking into



consideration both government subscriptions and funds raised by bond sales, the United States accounts for somewhat less than half the loan funds of the Bank. The European participation in the Bank, especially, is increasing all the time. European governments have now paid into the Bank more money than the United States, and we are borrowing more and more money from European investors. In the year just past, for instance, we borrowed \$100 million in this country, and more than \$300 million in Europe.

But as you know, the primary business of the Bank is not borrowing; it is lending. We hung out our shingle in 1946, and made our first loans in 1947. In that year, in the space of about four months, we lent half a billion dollars to assist the recovery programs of four European countries: France, The Netherlands, Denmark and Luxembourg.

None of us will soon forget, I am sure, how dark these days seemed in Europe. Staggering under the burdens and deprivations of war, public treasuries were nearing exhaustion; stocks of food and of industrial raw materials were running low; the specter of political turmoil was looming larger and larger on the Continent.

These loans of the Bank, while small in themselves, helped Western Europe to turn away from possible chaos to orderly recovery. They helped continue the flow of essential raw materials and of new capital equipment to Europe at a time when an interruption of the flow might have had disastrous consequences. While these loans were made at what appeared at the time to be considerable risk, not one of them has been defaulted, and more than \$150 million worth have actually been paid off substantially ahead of time.

In 1948, the year following the reconstruction loans, the Bank was able to turn its attention to the longer range job that it is still carrying out today. This is the job of helping to develop productive resources in its member countries. There are resources still to be developed almost everywhere, and in fact much of



the Bank's development lending has been done in Europe -- to develop the large hydroelectric potential of Austria and Norway, for instance, to reclaim and develop land in the long depressed area of Southern Italy, and to improve the network of inland waterways which is indispensable to Belgium's internal and international trade.

The chief theater of operations for the Bank, however, is the underdeveloped world -- which is to say virtually all of Africa, Asia and Latin America. Here, the Bank has been able to do some lending for industry, especially for the expansion of private steel companies in India. We have also been able to lend for land reclamation and irrigation projects that will directly benefit the farmer.

But the need of the underdeveloped world is overwhelmingly for basic projects that will aid both industry and agriculture. This explains why the great bulk of the Bank's lending is in the fields of electric power development and of transportation. The Bank has now lent \$4 billion for development; and 70% of it has been for these two purposes.

In India, for example, the Bank has made a series of loans aggregating \$225 million to help finance imports needed in a large railway improvement program.

The program already has enabled India's railway system to handle the 20% increase in freight tonnage arising from the country's First Five Year Plan that ended in April 1956. It is now helping the railways keep abreast of the Second Five Year Plan, which with its emphasis on development of industry and trade, is expected to raise freight tonnage by an additional 40% or more.

In Thailand, to mention another example, we have made a loan of \$66 million for a large multipurpose hydroelectric, flood control and irrigation project. This undertaking, known as the Yanhee Project, includes as its main installation a 500-foot-high dam on the Ping River. At this site, there will be



installed a 140,000-kilowatt generating station which will supply much needed power to Bangkok and eleven other communities. But the most important benefits to Thailand, which depends on agriculture for the bulk of its national income and foreign exchange earnings, are flood control and more water for irrigation.

Water stored by the Yanhee dam will supply irrigation through the dry season to a large new irrigation system serving more than 2.2 million acres of land. This system was partly financed by a World Bank loan made in 1950. Full operation of the system, it is estimated, will increase Thailand's agricultural production by \$16 million annually, of which \$5 million will be additional rice for export.

To make one final example, you all know that the Bank has made a large loan, of \$80 million, to help finance the Kariba Gorge power project in the Federation of Rhodesia, in Central Africa. The building of this project has been an adventure ranking with the most exciting that engineers and financiers have ever undertaken. The first stage of the project, now largely completed, called for the construction of a dam which is creating a reservoir 130 miles long and a power station with a capacity of 600,000 kilowatts. In the second stage, which is yet to come, present plans contemplate the installation of six 150,000-kilowatt units, making a grand total of 1,500 megawatts.

The task of harnessing great rivers to man's use must often be difficult, but the Kariba project has undergone trials of an altogether exceptional character. The average annual peak flood in the Kariba Gorge had been recorded over a period of years at about 220,000 cubic feet per second. In 1957, the first flood season after construction began, the peak flow was approximately 300,000 cubic feet per second, causing some damage to the site. Then in early 1958 the river showed its real power by rising to a peak flow of about 600,000 cubic feet per second, or double the normal wet-season flow over Niagara Falls. On this occasion the damage was even more extensive, as I saw for myself when I



visited Kariba soon after the flood had subsided. Yet by the end of last year, the building program was back on schedule, and this year's flood caused no difficulties. So, in spite of everything, Kariba will put its first power on the line at the beginning of next year.

The projects I have mentioned are, as it happens, all of large scale. But even projects on a much smaller scale present unusual problems for many of the Bank's borrowers. They are problems of planning, organization and execution and they are made difficult because the underdeveloped countries as yet have only a little experience in tackling development schemes.

For the Bank, the result is that we feel it necessary to take even more than ordinary banker's care in considering and investigating loan proposals. We do our best to see that projects are selected that will contribute most to strengthen the economy of the borrowing country. The situation in each country must be considered on its own merits. Deciding on the economic benefits to be expected from a project is, of course, only a first step. The Bank also needs to assure itself that the technical, financial and administrative plans are satisfactory. These points often involve study and negotiation over a broad field. For example, we have to be satisfied that the engineering plans have been competently drawn, that the project is suitably designed and that construction will be entrusted to competent hands and will be properly supervised. In making the necessary preparations for a successful project we believe that considerable advantages can often be obtained if the borrower calls in consultants for the planning, design and supervision of construction.

Employment of consultants can protect the borrower against unnecessary expenditure due to imperfections in design and can insure that engineering and other factors are thoroughly investigated and planned before work begins. During actual construction, employment of consultants to supervise the work of contractors and others can help to keep down costs and to guard against delays



in the construction schedule. The Bank, therefore, recommends to its borrowers that they employ consultants on all projects where benefits of this kind are likely to be derived.

In connection with employment of consulting engineers for the projects the Bank is helping to finance, it is our policy to leave their selection to the borrower. The Bank must, of course, be satisfied that the firms appointed have had satisfactory experience on comparable projects, that the staff to be assigned to the particular work are qualified and that the terms of reference under which they are employed are such as to assure satisfactory execution of the project.

The consulting engineer whose terms of reference include the preparation of designs and specifications is responsible for the accuracy and suitability of his work and no modifications should be made without his consent. With regard to other matters the consulting engineer will ordinarily act as advisor to the borrower on all technical problems with authority to make final decisions within such limits as may be prescribed by the borrower.

In the past borrowers have often asked the Bank for lists of qualified consulting firms from which to make their choice. Experience has shown that the furnishing of lists of qualified consulting firms has many disadvantages from the Bank's point of view. For projects of the usual type involved in our loans it is impossible to draw up representative lists of suitable length without leaving out many qualified firms. The only fair procedure would be to try to furnish exhaustive lists to borrowers, but that would place on the Bank the responsibility for making sure that its information about consulting engineers throughout the world was current and complete, and the length of the resulting lists would make them practically useless to the inexperienced borrower. Therefore, it is our policy to ask the borrowers to prepare their own lists by using their own contacts or their Embassies abroad to find firms competent to work on a particular project.

Borrowers without much experience in such matters may prepare a list from



recommendations of qualified sources such as other employers or the various associations of consulting engineers such as the constituent members of FIDIC. When the borrower has prepared a list it should be presented to the Bank in order that the latter may inform him whether the firms on the list would be acceptable to handle work on the project under consideration for a loan. In order to have information readily available for reviewing firms on a list submitted by a potential borrower, the Bank maintains a file of consulting engineers all over the world, their size, experience, field of work, the territories in which they have operated and so forth. This information can in no sense be regarded as a list of approved consultants. It is merely one guide that the Bank can use when the time comes for it to pass judgment on the qualifications of the consultant selected by the borrower.

Since the Bank does not recommend consulting engineers, it is essential that a consultant interested in obtaining work abroad find out about the projects before they reach the stage of a negotiated loan. The only way to do this is through information from the countries concerned. Contact must be established with them and their Embassies.

You may be interested in the approximate dollar value of engineering services required for the projects which the Bank assisted in financing during the fiscal year ending June 30, 1959. The Bank loans totaled \$703 million. This sum, of course, does not represent the total investments, as the Bank's normal lending takes the form of loans for foreign exchange to finance that part of the cost of the project or program representing requirements for imported goods and services. The total investment cost, dollar equivalent, represented by the \$703 million loaned by the Bank last year is about \$2.6 billion. Examination of the specific loans involved indicate that about \$2 billion would require varying degrees of expenditure for engineering. Past experience shows that the cost for engineering services on large projects averages about 4%. Therefore, the



expenditure for engineering services generated by the loans made last year would be at least \$80 million.

May I again return to the subject of the Council's relations with FIDIC and some of the problems of concern to the consultant in the international field. Early in 1959 the Bank learned through inquiries from consulting engineers that one of its member countries in the Far East had issued a Tender Notice (bid) inviting tenders for the preparation of designs, drawings, estimates, specifications, etc. for a reservoir project. Wide distribution was given to the Tender Notice through publication in newspapers and circulation of the Notice to foreign Embassies. The Notice invited firms of qualified and competent consulting engineers having considerable specialized experience in the design of large engineering projects to submit tenders on the basis of a lump sum contract.

The Bank was not notified that such a procedure was to be followed; in fact, the project was not even under consideration for a loan. However, the Notice included the statement that "Tenders from only those tenderers who are acceptable to the International Bank for Reconstruction and Development will be considered". Hence the inquiries from U.S. and foreign consultants. The Bank objected to being placed in the position of pre-qualifying consulting engineering firms under such circumstances and pointed out to the Member Country that it does not support competitive bidding procedures for professional services of consulting engineers. I might add that in the replies to inquiries from consulting engineering firms it was emphasized that the question of circulating Tender Notices had not been discussed with us, we would not pre-qualify consulting firms under such circumstances and the Bank would not support competitive bidding procedures for professional services of consulting engineers.

Within a short time amendments to the Tender Notice were issued deleting the requirement for pre-qualification by the Bank and permitting consultants to make alternate proposals or offers on the basis of their own methods of tendering



or applying for the work envisaged instead of on a lump sum contract basis.

The matter was considered closed insofar as the Bank was concerned, but just recently a letter has been received from the Association of Consulting Engineers (Incorporated) of Great Britain, a constituent member of FIDIC, stating that the procedure followed was contrary to the usual practice of the members of their Association and that their Council was interested to find out what the reaction of the leading firms of American consulting engineers would be to this procedure. The Association reported that 29 tenders were submitted for the work, of which 8 were from American firms, some of whom probably could not be classed as independent consulting engineers. Of these American offers three did not submit "lump sum" quotations as requested, but suggested a percentage fee based on the ultimate cost of the project, this being more in accordance with the usual consulting engineering practice. One American firm offered to do the work for cost plus a surprisingly small fixed fee, in dollars. However, three other well-known firms of American consultants stated that their professional rules prevented them from making offers, but gave their qualifications and invited negotiations. In addition to United Kingdom and American offers, firms in Canada, Liberia, Greece, India, Yugoslavia, Pakistan, Italy, Germany, Finland, Switzerland, Australia, France and Japan submitted tenders.

The Council of the British Association of Consulting Engineers feels that the method of selecting consultants by public advertisement may in fact lead to the elimination of some of the most suitable firms of engineers, and suggests that it may not be very difficult to adopt some internationally acceptable procedure for giving a reasonable number of members of recognized institutions or associations throughout the world an opportunity to state their fees without adopting uncontrolled competition and the subsequent difficulty of making a reliable selection.



I must say that I am in complete agreement with the position taken by the British Association of Consulting Engineers in the establishment of internationally acceptable procedures for the consulting engineering profession. It would appear that FIDIC is the most appropriate organization to handle such problems and, inasmuch as eight consulting engineering firms from the United States were involved, it would be most appropriate for a Committee on International Relations of your Council to give prompt consideration to the proposal of the British Association of Consulting Engineers.

Another example of an international problem that should be of concern to U.S. consultants and Consulting Engineers Council is the question of contract bonds, usually included in the general conditions of contract for a construction contract. I refer specifically to Performance Bonds, Labor and Material Bonds and Bid Bonds or, using the terminology of FIDIC, Tender Bonds. The Conditions of Contract (International) for Works of Civil Engineering Construction, issued in 1957 and prepared, approved of, and ratified by the International Federation of Consulting Engineers (FIDIC) and the International Federation of Building and Public Works (FIBTP) contains the statement that sureties or performance bonds of the contractor to the employer or owner shall not exceed 10% of the tender or bid sum for the due performance of the contract.

As you know, in the United States it is customary for the owner to require a 100% performance bond, as the premium on a performance bond is based on the amount of the contract and not the size of the bond. Therefore, the premium on a 100% bond is little more than that for a 25% or 50% bond. Contract documents written by U.S. consultants for work in foreign countries generally contain a requirement for a performance bond of at least 50% of the contract price and in some cases 100%. These requirements are creating a source of difficulty abroad, as it is customary in many European countries to use a commercial Bank Guarantee which has premiums considerably in excess of those offered on performance bonds to



U.S. contractors working abroad. These foreign contractors invariably point to the Conditions of Contract for Works of Civil Engineering Construction, a document approved of and ratified by FIDIC together with the International Federation of Building and Public Works. I realize that your Council did not have a hand in preparing or approving the document, but again the Council might find it advisable to recommend that certain changes be made in order that the document might conform at least to U.S. as well as European practice.

In that connection I am informed that FIDIC is preparing a new document entitled "International Conditions for the Supply of Plant and Machinery" covering the mechanical and electrical work for civil engineering construction. Possibly a committee of your Council may wish to take a good look at that document before it is released.

There is one other matter that might be worthwhile mentioning for your consideration. If any of the Members of the Council have examined the international conditions of contract that were distributed at your Semi-Annual Meeting last year and copies of which have been given wide distribution by Mr. Tritton, President of FIDIC, you will have noted that no contracting organization from the United States is a Member of the International Federation of Building and Public Works (FIBTP). Many large American contracting organizations are doing work abroad. In fact, many of them have contracts on projects being financed with the help of the World Bank. It would appear that an organization such as The Associated General Contractors of America, with a membership of some 7,000 contracting firms, would have an interest in an international document outlining conditions of contract for works of civil engineering construction as well as the document being prepared jointly by consulting engineers and contractors outlining conditions for the supply of plant and machinery covering mechanical and electrical works. I note that the Canadian Construction Association is a member of the International Federation of Building and Public Works, and no doubt



your Council's hand would be greatly strengthened in dealing with international matters of interest to consulting engineers and contractors if it were supported by a strong U.S. contracting association such as The Associated General Contractors of America. You may also wish to look into this matter.

Before closing, may I tell you how pleased I am that Consulting Engineers Council, representing as it does the consulting engineers in the United States, is now in a position to deal with international problems. Your advice and assistance is needed not only by U.S. consultants doing work abroad, but also by the less developed countries throughout the world and your European colleagues. I appreciate the fact that with a young and rapidly expanding organization you are faced with many problems at home. I am sure, nevertheless, that you will meet the challenge of your recently acquired international obligations with the same zeal and vigor that have been displayed by your Board of Directors during the past three years.



ADDRESS BY GAIL A. HATHAWAY, ENGINEERING CONSULTANT,  
INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT,  
BEFORE THE INSTITUTE FOR  
INTERNATIONAL ENGINEERING  
BOULDER, COLORADO  
JANUARY 24, 1963



---

PROGRAMS AND POLICIES OF THE WORLD BANK

First of all, Mr. Chairman, I should like to compliment the University of Colorado and cooperating organizations for sponsoring the first Institute for International Engineering, thereby providing an opportunity for the exchange of ideas between the engineering profession and national and international organizations that finance or otherwise assist enterprises abroad. May I also thank the officials of this meeting for the opportunity to participate in today's Forum.

According to the preliminary information concerning the first Institute for International Engineering, the fundamental objective of your program is to stimulate international engineering operations by American firms as a contribution to the development of American export trade.

How best can the World Bank help in this regard? This question, I am sure, will be uppermost in your minds. Several years ago, this same question was of great concern to many consulting engineers and contractors across the Atlantic, who entertained a fear - subsequently proved unfounded - that the Bank, to which many member nations contributed according to their means, might increase the prosperity of the United States by channeling the Bank's expenditures to U.S. goods and services. I should like to make it clear that the Bank cannot make "tied" loans, that is, require its borrowers



to place their orders in any particular member country. Our basic concept is multilateral lending for development; hence our business is open to international participation.

As an international cooperative institution with 81 member countries, the Bank's main job is to promote economic progress in the less developed member countries by providing the catalyzing external resources and technical assistance. In its own interest as well as that of the borrowing country, the Bank attaches great importance to the procurement of goods needed for a project on the best possible terms. To this end, the Bank encourages its borrowers to obtain supplies on an international competitive basis, unless this procedure is clearly inappropriate. Since the borrowers are free to use the proceeds to make purchases in any member country, those interested in securing business under Bank loans should look to the borrowing countries and not to the Bank. A considerable potential market is unfolding for the professional services of developed countries. It is up to you to take advantage of the opportunities provided by this great human endeavor of helping the underdeveloped world to attain rapid economic progress.

The activities of the Bank have led to substantial stimulation of business in capital exporting member countries. A study of the list of orders placed by Bank borrowers using Bank loan funds will show how wide the distribution had been. Out of a total of \$3,734 million worth of orders placed by borrowers by international bidding up to June 1962, the share of the U.S. was \$1,752 million - a little under 50%. The United Kingdom, Germany, Canada, France, Belgium, Italy, Japan, Switzerland and Sweden together accounted for \$1,982 million. The share of other countries amounted to \$209 million. These figures illustrate the widespread use of Bank funds as a stimulus to international trade in capital goods.



Before coming to the subject of the Bank's relation with consulting engineers, let me give a few basic facts about the Bank and its two affiliates - the International Finance Corporation (IFC) and the International Development Association (IDA). They represent the spirit of purposeful international cooperation engendered on the one hand by the challenging desire of the less developed countries to achieve economic progress, and on the other hand the wish on the part of advanced nations to assist them in their economic development. Since all three institutions contain both creditors and borrowers, they have an objective approach to the problems of development. The three institutions differ from each other, of course, in regard to their assets, liabilities, and capital, which are wholly separate. But their ultimate goal remains the same -- that of assisting member countries in financing productive projects and programs essential for development. Membership in each agency is dependent on a country's government signing the international agreements under which they were established and on the subscribing to a share capital in each organization. Membership in IDA and IFC is open only to members of the Bank.

The World Bank, officially called the International Bank for Reconstruction and Development, was founded, along with the International Monetary Fund, at the Bretton Woods Monetary and Financial Conference in July 1944. By international treaty (Articles of Agreement) among its member countries the Bank was established as an intergovernmental institution, corporate in form, with all its capital stock being owned by its member governments. It is authorized to make or guarantee loans for productive reconstruction and development projects, both with its own capital funds and through the mobilization of private capital, and is provided with a financial structure under



which the risk of such investment is shared by all member governments roughly in accordance with their economic strength.

Its objectives are implicit in its official title. The initial emphasis of Bank activity was on the urgent problems of reconstruction of the war ravaged economies of Europe. The first loans of the Bank, made in 1947 and totaling \$497 million, were in the nature of emergency assistance to four Western European countries to prevent threatened interruptions in the flow of essential imports. These loans, by permitting the borrowing countries to sustain the volume of imports necessary both for the continued rehabilitation and operation of their productive facilities, helped to prevent a disastrous drop in production and possible economic collapse. Since 1948 the Bank's efforts have been concentrated on aiding economic growth of its less developed countries. To this end, it has so far lent about \$6 billion to 60 member countries. It is the Bank's established practice not to finance the whole cost of any project or program. Its normal lending takes the form of loans in foreign exchange to finance that part of the cost of the project representing the requirements for imported goods and services. Hence it is very safe to assume that the borrowing countries have mobilized amounts equivalent to another \$6 billion to match the Bank loans. Viewed in the context of the estimated needs of less developed countries and in the light of your fundamental objective, a total mobilization of over \$12 billion to help finance a wide range of sound projects may not appear gigantic. But it is by no means insignificant.

The bulk of Bank loans has gone to help finance the development of basic utilities, such as transportation and electric power, projects which appear unattractive to the private investor but are essential for economic



progress. Bank loans toward development of transportation have amounted to \$2,078 million. Loans toward electric power generation and distribution total \$2,213 million. At the same time importance is attached to the investment needs of industries. The Bank's contribution toward development of industry amounted to \$1,019 million.

The Bank is not only a lender but also a borrower, since the capital subscribed by its member governments was never intended to finance all its operations. Whereas the Bank has already paid out about \$4,800 million on its loans, it has used or allocated only the equivalent of \$1,655 million from government subscriptions. The remainder of its funds has been drawn mainly from the sale of its bonds in the capital markets of the world. During the immediate postwar period, for well known reasons, the Bank was obliged to depend on the United States for virtually all its funds. With the economic recovery of other countries, there has been a sustained broadening of international support for the Bank's finances. By June 1962 the Bank had outstanding borrowings of over \$2,500 million, mostly in the form of U.S. dollar bonds, but also including bond issues denominated in Canadian dollars and European currencies. Over half of these borrowings are owed to private or public investors outside the U.S.

Like most prudent lenders, the Bank seeks to determine the extent to which a member country can afford to service additional foreign indebtedness. In making or guaranteeing a loan the Bank is obliged under the Articles to pay due regard to prospects of repayment. Even apart from this provision, it is implicit in the concept of the Bank as a continuing institution, designed to operate on a sound business basis and with funds borrowed in the private market, that it should make loans only where there are reasonable prospects of repayment.



All loans other than those to member governments, whether to government agencies or private enterprises in their countries or territories, must carry the repayment guarantee of the government concerned. The rate of interest charged on Bank loans has varied over the past five years between 5% and 6 $\frac{1}{4}$ %.

As a first step before granting a loan, the Bank seeks to determine the economic priority of the project for which the loan is sought. It also needs to assure itself that the technical, financial and administrative plans for the project are satisfactory. Determination of these points often involves investigation, study and negotiation over a broad field. For example, the Bank wishes to be satisfied that the engineering plans have been competently drawn, that the project is suitably designed, and that construction will be entrusted to competent hands and will be properly supervised. It wishes to be satisfied, too, that cost estimates are complete and accurate and that the financial structure of the enterprise is appropriate for the type of venture involved. The arrangements for obtaining the remainder of the capital not supplied by the Bank are also carefully scrutinized to determine their adequacy to assure prompt completion of the projects.

In its efforts to stimulate development, the Bank places special stress upon the growth and expansion of the private sector of the economy. A great many of the Bank's loans are designed, either directly or indirectly, to stimulate private investment and the importance of private enterprise; this has consistently been emphasized by Bank missions.

The financial operations of the Bank are only one of the means by which it helps to promote economic development. Ever since 1948, when the Bank turned from reconstruction to development lending, it has been alive to



the need for technical assistance to the developing countries. In the early years of its operations, the Bank's assistance was primarily directed toward helping member countries and territories to analyze their economies and to make recommendations designed to form the basis of long-term development programs. Other technical assistance services of the Bank have also been steadily extended, and range from special missions on regional development to the day-to-day work of the Bank's engineers, analysts and economists visiting member countries to help them with specific projects. A staff college in economic development -- the Economic Development Institute -- has been operated by the Bank since 1956, and various training programs are organized for officials from the less developed countries.

Last year the Bank launched an expanded program of project and sector studies. It has organized and helped to finance a variety of such pre-investment studies. Included in the list are a general transportation study in Colombia, a railway survey in Bolivia, port studies in Haiti and Honduras, a study for a crossing of the Hooghly River in Calcutta, a survey of the Capital market in Chile, investigation of a water supply project in Manila, a study of feeder roads in Northeast Nigeria, a general transportation survey in Ecuador and a study of a road project in Burma. These pre-investment studies are expensive and often involve the employment of outside consultants with consequent costs in foreign exchange. The Bank also acts as Executing Agency for a number of UN Special Fund projects. In all cases this work is carried out under Bank supervision by outside consultants chosen jointly by the Bank and the country concerned.

Before discussing more in detail the Bank's relationships and policies concerning the use of consulting engineers, I should like to tell you about



the Bank's two affiliates. The first of these, the International Finance Corporation, or IFC, was formed in 1956 to fill a need in the industrial sector of less developed countries. The Bank has, of course, made several loans to private industrial corporations, notably the big steel companies in India and Japan. But such Bank loans require a government guarantee, which is not always obtainable from the government, or indeed always acceptable to the private corporation. Moreover, the Bank's participation in these enterprises can only be in the form of loan capital, and private industry often requires finance in the form of equity participation, sharing the risks of the enterprise. Hence the need for IFC, which invests in private industrial enterprises without a government guarantee. Although it has a separate charter, and its own funds, IFC is closely integrated with the Bank. With its relatively modest resources -- \$98 million paid in by 71 member countries -- the Corporation has so far made 52 investments totaling \$68 million in about 21 countries. IFC has established a Development Bank Services Department, which is responsible for planning financial and technical assistance to help in establishing or expanding privately-owned and managed industrial development banks in less developed countries.

Another important step was the establishment in 1960 of the International Development Association as a second affiliate, sharing with the Bank the same management and staff. IDA was founded to provide funds to developing countries whose ability to make effective use of capital is greater than their capacity to assume and repay debt on conventional terms. IDA credits made up to now are repayable over 50 years, are free of interest, and carry only  $3/4$  of 1% annual service charge. But, soft as these terms are, the projects submitted for IDA financing should meet the same technical, economic, financial and administrative standards as the World Bank itself would look



for if the Bank were making a loan for that project on conventional terms. To date, IDA has extended credits equivalent to \$348 million to 14 countries. Of this, \$158 million had gone to help finance development of transportation. Credits toward development of agriculture and forestry totaled \$92.2 million.

May I return now to the subject of the relationship that the Bank and its borrowers have with consulting engineers. In making the necessary preparations for a successful project we believe that considerable advantages can often be obtained if the borrower calls in consultants for the planning, design and supervision of construction. Employment of consultants can protect the borrower against unnecessary expenditures due to imperfections in design and can ensure that engineering and other factors are thoroughly investigated and planned before work begins. During actual construction, employment of consultants to supervise the work of contractors and others can help to keep down costs and to guard against delays in the construction schedule. The Bank, therefore, recommends to its borrowers that they employ consultants on all projects where benefits of this kind are likely to be derived.

It is important to note that the Bank maintains a close relationship with its borrowers throughout the life of each loan. Such a procedure helps to bring to light at the earliest possible moment unforeseen difficulties, technical, administrative, financial and the like.

Borrowers often ask the Bank for lists of qualified consulting firms from which to make their choice. This the Bank cannot do. For projects of usual types it is impossible to draw up representative lists of suitable length without leaving out many well-qualified firms. The only fair procedure would be to try to furnish exhaustive lists to borrowers, but that would place on the Bank the responsibility for making sure that its information about



consulting engineers throughout the world was current and complete, and the length of resulting lists would make them practically useless to an inexperienced borrower.

In order that the Bank may be able to pass on the acceptability of firms chosen or proposed by member countries, it must maintain information about consulting engineers of various kinds in member countries, including information concerning their qualifications, experience, etc. The Bank's information about consulting engineering firms is intended to be as complete as possible and to include all known firms undertaking consulting engineering work, regardless of their qualifications, ability or experience. The fact that the Bank has information about a firm does not, however, entitle that firm to any work connected with the Bank nor to indicate that the Bank will approve its appointment for any specific project.

But the Bank does not select consulting engineers or other types of technical firms for the projects on which loans are made. It relies on its borrowers to arrange this service. However, the Bank does require that the firm appointed by the borrower shall have had satisfactory experience on comparable projects; that the staff to be assigned to the particular work is qualified and adequate, and that the terms of reference under which they are employed are such as to assure the satisfactory execution of the project.

Since the Bank does not recommend consulting engineers for a project on which a loan is made, it is essential that a consultant interested in obtaining work abroad find out about the projects before they reach the stage of a negotiated loan. One of the difficult problems facing the consultant is to locate the potential projects abroad. However, there are many sources of information if properly used; such as, the Embassies of the underdeveloped countries, Commercial Counselors of the U.S. Embassies abroad, press releases



and reports of economic missions sent by lending agencies to underdeveloped countries, and publications such as "International Commerce" of the U.S. Department of Commerce.

After a consulting engineer satisfactory to the borrower and the Bank has been chosen, the Bank's primary interest is to see that the responsibilities of the consulting engineer are clearly set out in his agreement with the borrower, and that he is fully utilized in carrying out those responsibilities. To achieve this, it will be necessary in most cases to have consultations with the borrower and his proposed consulting engineer to agree on terms of reference for inclusion in the agreement, and to ensure not only that the consulting engineer is aware of the terms and conditions of his employment but, also, that the borrower is aware of the responsibilities and authority which the consulting engineer is going to bear on his behalf. During these discussions, the Bank will make clear to both the borrower and consulting engineer any requirements which the Bank may have, and satisfy itself that the borrower will give to the consulting engineers sufficient power and discretionary rights to exercise their responsibilities objectively and carry out efficiently the terms of their agreement.

There are some instances where the Bank takes a more active role in the selection of consultants, such as the United Nations Special Fund studies in which the Bank is serving as the executing agency, and the technical assistance projects or sector studies that are partially financed by the Bank in cooperation with a member country of the Bank. For such assignments the consultants are generally selected by the Bank in cooperation with the government concerned. Normally, the contract for the consultant's services is approved by the Bank but signed by the appropriate agency of the particular government.



Consulting engineers may be employed by the Bank to assist in project appraisal and end-use supervision. Ordinarily project appraisals and end-use inspections will be carried out by members of the staff of the Department of Technical Operations. However, it may become necessary to employ consultants when peak loads require supplementing the staff temporarily, or when projects to be appraised are of such a nature as to require specialized knowledge that is not available in the staff.

In considering the possibility of overseas' engineering work generated by Bank financed projects during the fiscal year ending June 30, 1962, you may be interested in an estimate of the amount of engineering fees involved. The Bank loans totaled \$882 million. This sum, of course, does not represent the total investments as the Bank's normal lending takes the form of loans for foreign exchange to finance that part of the cost of the project or program representing requirements for imported goods or services. The total investment costs, dollar equivalent, represented by the \$882 million loaned by the Bank last year is about \$3.64 billion. Examination of the specific loans involved indicates that about \$2.8 billion would require varying degrees of expenditures for engineering. Past experience shows that the cost for engineering services on large projects averaged about 4%; therefore, the estimated expenditure for consulting engineering services generated by the loans made by the Bank last year might be as much as \$110 million.

The funds expended for engineering services on Bank projects alone, disregarding the UN Special Fund, our technical assistance studies as well as other international and national lending agencies doing business abroad, provide ample evidence of the opportunities available to the consulting engineer but he will be confronted with many difficulties such as working in a different environment from that at home, aggressive competition from foreign consulting



firms whose professional salaries are much lower than in the States, and the trend of many foreign governments to ask for bids for professional services, to name only a few. To be effective, the consultant should know the people with whom he is working - their history and customs, motivations and beliefs, and he must possess the imagination to adapt his technical knowledge for use in a pre-technical society. Consultants engaged in development work overseas should have available, preferably from within their own organizations or from some outside source, the much needed economic and financial expertise. In the Bank we are constantly encouraging engineers who work with us to cultivate an eye for the economic problem. The Consulting Engineers Council, which is cooperating with the University of Colorado in sponsoring this Institute, might well discuss with the universities and other foundations of engineering talent, the advantages of including in the engineering curriculum more than is done now of the various practical aspects of economics and finance.

There has been a great deal of concern recently regarding the accepted practice in many foreign countries of price bidding for engineering services. First, may I say that the World Bank, in order to carry on its work efficiently, must utilize the services of the engineering profession and we are endeavoring to conduct our relations with consulting engineers in a professional and ethical manner. However, it is my view that there is much that could be done to eliminate price bidding by our professional societies, consulting engineering associations and, in particular, by the consulting engineers themselves.

The public grants to a profession more or less tangible monopolies and self-governing privileges, in consideration of which the profession engages to admit to its circle only men of proved competence, to guarantee their trustworthiness, to insist on the observance of ethical relations and practices, and to protect the public against bungling and extortion.



The self-policing responsibilities of a profession must be accepted and implemented by each individual member, regardless of position, and the consulting engineer carries more than his share of the burden, particularly in dealing with officials of many young and immature foreign governments that have had little experience with, or knowledge of, the standards of competence and ethics of the engineering profession. Notwithstanding these difficulties, the profession must guarantee the trustworthiness of its practitioners and in return can expect to be protected from the incompetent judgment of the lay public by a privileged position before the law.

\*\*\*\*\*