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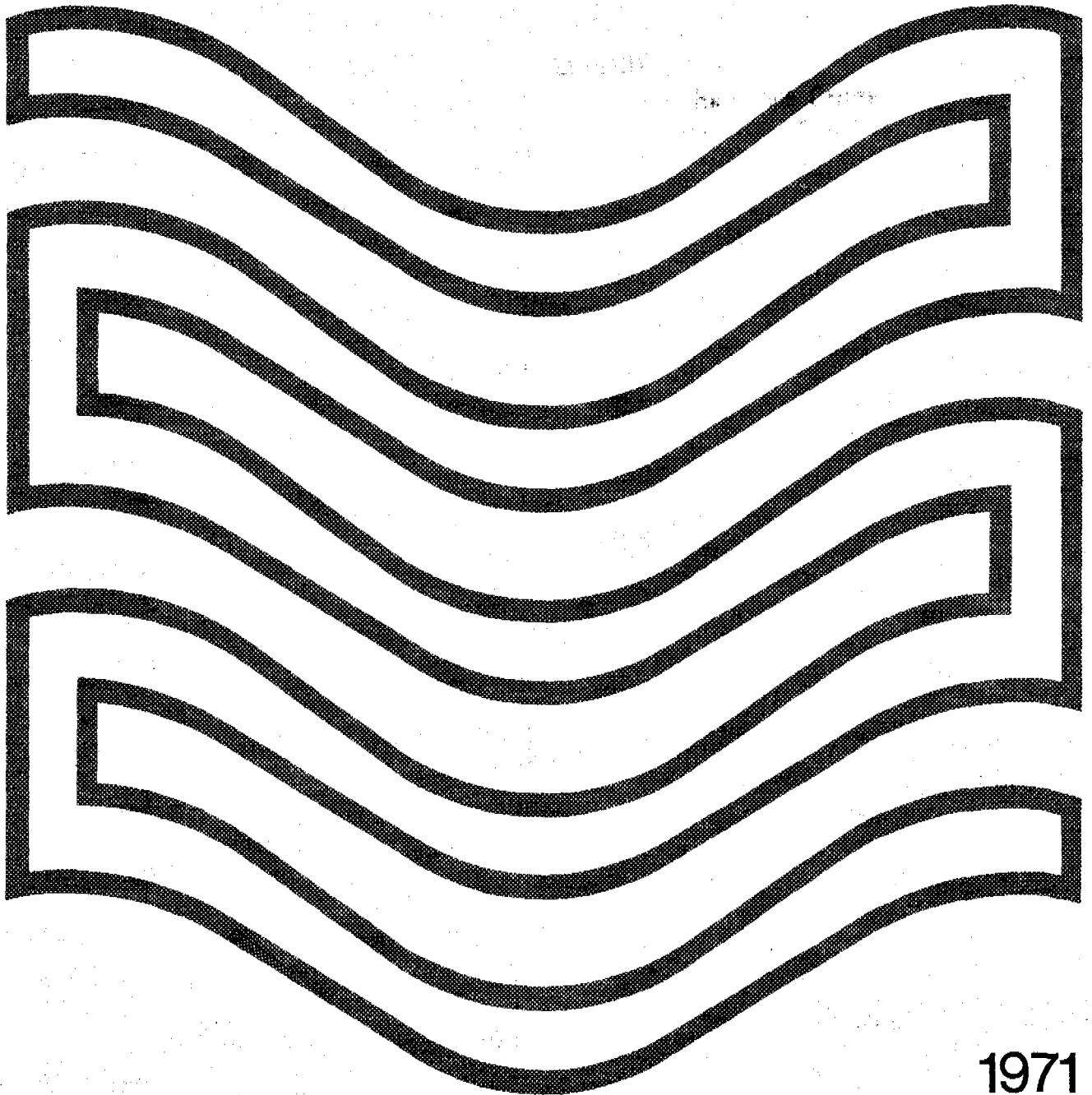
IRC 71

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**International reference centre
for community water supply**

parkweg 13, the Hague, the Netherlands

third annual report



1971

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W.H.O. International Reference Centre
for Community Water Supply

The Hague, The Netherlands
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Annex:

List of Collaborating Institutions as of January 1972



Old man filling an oil tin with water, near St. Chaterine pumping station

1. I.R.C. SCOPE AND OBJECTIVES

One of the basic requirements for environmental sanitary improvement consists of the supply of safe and sufficient water. In many parts of the world however, the activities directed to the provision of more and better quality water are inadequate to enable the countries to cope with the increasing problems consequent upon population expansion and urbanization, or even to fill the present needs.

In developing countries especially, a large proportion of the population has to rely on supplies which are neither safe nor adequate. It is believed that until this position is remedied by the construction of abstraction, treatment, storage and distribution works, control of waterborne diseases and environmental deficiencies can never approach completion.

For this reason WHO proposed targets for achievement during the U.N. Second Development Decade 1971 - 1980 as one of the measures to accelerate the progress of community water supply. The set-up of a WHO International Reference Centre for Community Water Supply (I.R.C.) forms a method to sustain this programme. The agreement between WHO and the Government of The Netherlands to establish such a Centre at The Government Institute for Drinking Water Supply at The Hague was concluded in December 1968.

I.R.C. operates as the nexus of a world-wide network of Collaborating Institutions, which are active in water supply research and development. The activities are carried out in cooperation with the mentioned Government Institute as well as other bodies in The Netherlands, whereas many other institutions and agencies in different parts of the world contribute to I.R.C.'s programme.

The activities of the network are directed to both developed and developing countries (but to the latter in particular). In general I.R.C. sees as its objectives to provide information in the field of drinking water supply in all possible ways, to stimulate and coordinate research within the network and to develop criteria for design and operation of water supply facilities, while stimulating the application and the knowledge of these whenever and wherever wanted.

At the end of 1971, 28 institutions, selected and designated by WHO, were collaborating with I.R.C. The network of these Collaborating Institutions consists of universities, research establishments and other bodies active in the water supply field. A Collaborating Institution - formally designated as such by the WHO - can be defined as an institution that has shown a willingness to move into water supply research and development, is already engaged in research and development in community water supply or intending to be and is prepared to collaborate in a world wide programme.

The year 1971 can be described as the take-off phase of the Centre: a new activity has to find its way within existing systems of cooperation and relations. It has to prove its value before it can expect the assistance of all concerned. The Centre has the feeling that the point has been reached whereby the majority of the Collaborating Institutions acknowledge the place of the Centre and the value and mutual interest of the exchange of information by the Centre.

Many contacts have been established and from different sources appreciation was received for the work performed, which is the stimulus for more efforts to reach the ultimate goals. Against this background this report gives a survey of the activities of the Centre during 1971 with the sincere hope that 1972 will bring the final basis of a balanced programme for the coming years.

Enjoying artesian water

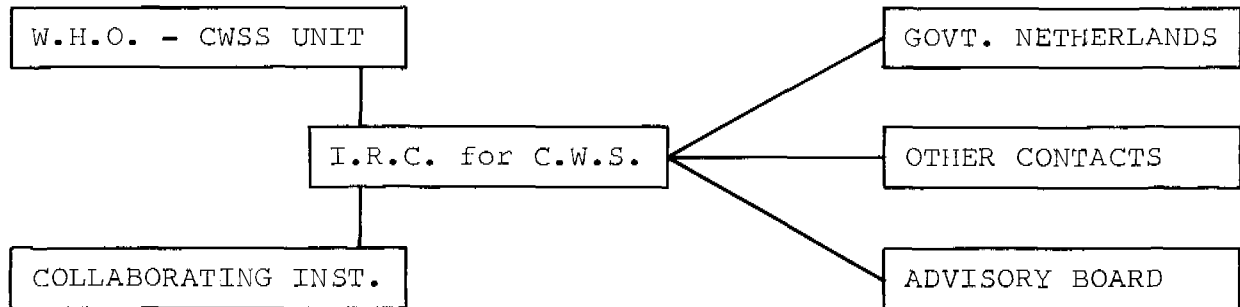
N.E. State, Nigeria



2. ORGANIZATION IN 1971

2.1 General

The I.R.C.-organization has been schematically visualized in the following organogram:



2.2 W.H.O. Community Water Supply and Sanitation Unit*)

In 1971 a lively contact was held with W.H.O.'s CWSS Unit. Many advices were received, information was given and a busy correspondence was conducted.

Mr. L.A. Orihuela, Chief W.H.O. Community Water Supply and Sanitation Unit and Mr. D.V. Subrahmanyam, official of the same Unit, paid a visit to the I.R.C. in December at the occasion of a meeting of the Advisory Board. Discussions on several subjects were held, particularly on the progress and the development of I.R.C., the network of Collaborating Institutions, the convening of a meeting on toxicity of uPVC pipes and coagulant aids in 1972 and many other current matters.

In May Mr. P. Stevens, at that time Chief of the Wastes Disposal Unit, visited I.R.C. in order to become acquainted with its activities.

Mr. Martijn, I.R.C. Manager and Mr. van Damme, Assistant Manager, paid a working visit to the CWSS Unit in February. Discussions included the iodine device, the nomination of new Collaborating Institutions and of twin institutions, future research programmes and several other practical items.

In June Mr. Putto, Deputy Director, visited the Unit. Amongst others the publication on plastic pipe, the forthcoming bulletins and the progress with the iodine device were discussed.

In connection with visits to Geneva for other purposes, Mr. Martijn visited the Unit again in August, November and December, in order to discuss current matters.

*) Until 1971: Community Water Supply Unit.

2.3 The Netherlands Government

The Netherlands Government provides I.R.C. with practical, technical and financial support. I.R.C. is housed in the building of the Government Institute for Drinking Water Supply and makes use of the facilities of this Institute and of the technical and scientific knowledge of its employees. The Director of the Government Institute acts at the same time as the Director of I.R.C.

2.4 The Collaborating Institutions

During 1971, 28 institutions were officially collaborating with I.R.C., A list of these institutions is attached to this document as annex I.

With a number of Collaborating Institutions close relations were held, and I.R.C. experienced great support and the provision of important knowledge and research results from these. Other institutions contributed according to their possibilities. A couple of institutions were not yet in the position to cooperate at all.

In the coming years an extension of the network will be necessary with more institutions which have adequate facilities to collaborate in a constructive way. Requests in this connection have been received by I.R.C. from several institutions in different parts of the world.

Apart from intensive contacts by mail, several personal visits to Collaborating Institutions were paid.

In May Mr. Martijn visited the Headquarters of the Central Public Health Engineering Research Institute (CPHERI) in Nagpur (India) and the Zonal Centre in Bombay. From both sides the visits were regarded as very useful and many possibilities for future work and cooperation were discussed, amongst others concerning the evaluation of the I.R.C. iodine disinfection device. It was agreed that CIPHERI will compile "The Story of CIPHERI", a case history of how to set up a research institution, which will be disseminated by I.R.C. to Collaborating Institutions. Another visit was paid to the Victoria Jubilee Technical Institute in Bombay, which also contributed much to a better understanding of mutual activities and possibilities. For I.R.C. the visit to India meant another widening of the experience and a new impu^Ils^I for further activities directed to the developing countries.

In August/September Mr. van Damme visited the Collaborating Institution in Israel: The Environmental Health Laboratory, Hadassah Medical School, Hebrew University, Jerusalem. A good impression was obtained of the sound research carried out in the well equip^Ied Laboratory. In a staff-meeting information was exchanged on facilities and activities of the

Laboratory and I.R.C., and ways of cooperation were discussed.

On the same occasion a visit was paid to the Sanitary Engineering Laboratory of the Middle East Technical University at Ankara, Turkey. It is hoped that in the near future, when new facilities will be available, a sound collaboration can be built up.

In conclusion it may be noted that during 1971 the network of Collaborating Institutions was brought into effective operation.

2.5 Advisory Board

The Advisory Board of I.R.C. has a consultative function and consists of bodies and institutions to which I.R.C. is connected directly or indirectly. Representatives of the following bodies form part of the Board:

- a. The World Health Organization;
- b. The section for International Health Affairs, Ministry of Public Health and Environmental Hygiene of the Netherlands Government;
- c. The Netherlands Waterworks Association;
- d. The Testing and Research Institute of the Netherlands Waterundertakings KIWA Ltd.;
- e. The Technological University Delft, Chair for Civil Sanitary Engineering;
- f. International Courses in Sanitary Engineering;
- g. The Research Institute for Public Health Engineering T.N.O.;
- h. The National Institute for Public Health.

To this Board is also nominated Professor W.F.J.M. Krul as an adviser. Representatives of Collaborating Institutions outside The Netherlands are also invited to participate in the Advisory Board meetings in order to avoid resolutions contradictory to immediate needs, especially in developing countries.

The forth meeting of the Board was held on December 13, 1972 in The Hague. During the meeting the future of the Centre and the progress in 1971 were discussed. It was a consensus that a closer cooperation between I.R.C. and the Collaborating Institutions has been established, that I.R.C.'s newsletters and bulletins ^{have met a need} met a want, that personal contacts stimulated the activities of I.R.C., and that the cooperation between I.R.C. and the International Water Supply Association has been strengthened.

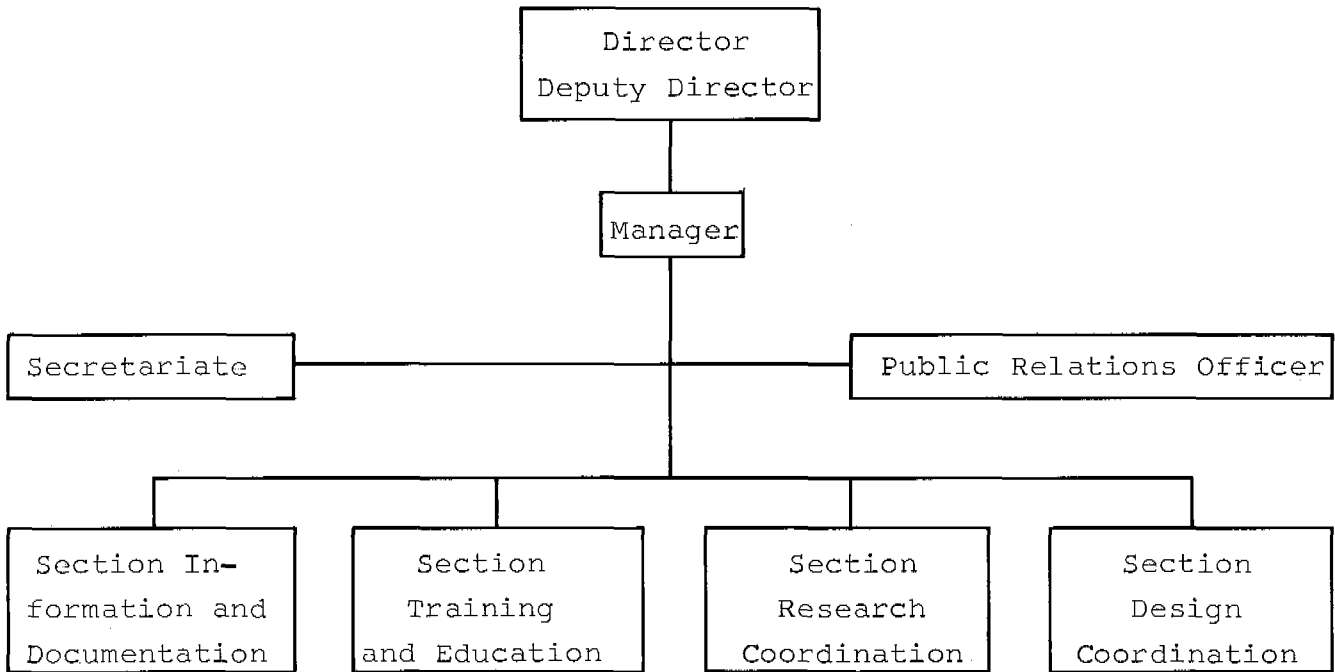
Furthermore it was concluded that efforts should be made to guarantee the future organization and budget of I.R.C. and that the network of Collaborating Institutions should be extended. The cooperation with the International Water Supply Association should be further continued.

2.6 I.R.C.

The activities of the I.R.C. are manifold but apart from the general work, can be summarized under two headings:

- a) Supply of information and knowledge in the community water supply field, collection, storage and retrieval of information and documentation as well as the provision of information by papers and reports, letters and newsletters, personal contacts, lectures and training and education programmes;
- b) Research and design projects: study and review of special subjects, evaluation of research results, conduction and coordination of research projects with an emphasis on application in practice and subsequent development of criteria against the background of needs both in developed and developing countries, but in the latter in particular.

In view of the future development of the Centre these aspects were classed under four sections. Because of the limited number of staff-members no division of the activities has been made as yet, but specialization will be necessary in coming years. The organization of the I.R.C. will then be as follows:



3. STAFF EMPLOYED IN 1971

Mr. T.K. Tjiook joined the Centre in November and is full time in service of I.R.C. He is first of all in charge of information and documentation, but devotes part of his time to design coordination. The staff further consisted of the same persons as the year before. Again Mr. Lieffering of KIWA gave very helpful assistance to I.R.C.'s activities.

At the end of 1971 the staff was built up as follows:

Director (part-time)	- Ir. T. Verheul
Deputy Director (part-time)	- Mr. G.W. Putto
Manager (part-time)	- Ir. Th.G. Martijn
Assistant Manager (part-time)	- Drs. J.M.G. van Damme
Information and Documentation	- Ir. T.K. Tjiook
Research Coordination and Education and Training	- Ir. A. Kepinski
Design Coordination (part-time)	- Ir. F.L. Schoufour
Chemical Aspects (part-time)	- Ir. J. Hrubec
Public Relations Officer (part-time)	- Mr. J. Lieffering
Secretary	- Miss M.L. van der Sar

It is hoped that in the near future the staff can be enlarged so as to guarantee a complete fulfillment of the objectives drawn up at the foundation of the I.R.C. and an adequate execution of the tasks laid down in the 5-years programme 1971 - 1975. This programme has been based on the results of the International Conference on Research and Development in Community Water Supply in Dubrovnik in 1970, and has been agreed upon in the meeting of the Advisory Board of December 1970. For marginal operation in 1972 the required staff has been estimated at a minimum of 10 persons (directors excluded).

4. FINANCES

Total costs of the Centre for the year 1971 amounted to approximately U.S. \$65,000.-

The yearly contribution of W.H.O. remained U.S. \$10,000.-

Support for 1972 is still subject to confirmation. On the basis of a staff of 10 persons (directors excluded), implying the performing of a minimum programme, the required budget for 1972 has been estimated at U.S. \$280,000.-

THE PHILIPPINES

In the countryside, necessity is the mother of invention and bamboo is made to serve many purposes. With the help of bamboo, water is brought from a source in the hills above the village down to near the houses.

In other villages housewives fetch water in hollowed-out bamboo trunks which can hold as much as 5 gallons. The safest water comes from bamboo pumps that lift the water straight out of the ground. One pump can supply enough water for several houses.

WHO photo by Rober Miller



5. ACTIVITIES IN 1971

5.1 Information and Documentation

Data Bank

The Information and Documentation Section collects all relevant information from all available sources, such as Collaborating Institutions, national and international agencies and organizations, universities, research institutions and water supply undertakings, as well as from conferences, papers, reports, and many other sources. The Section plans to establish a central data storage bank in the field of community water supply at an international level, from which all necessary information can be retrieved. The necessity of building up I.R.C. documentation-services was especially stressed during the Conference on Research and Development in Dubrovnik, 1970.

In 1971, there was no real possibility for I.R.C. to establish its own documentation facilities yet. During this period use was made of the facilities of the Government Institute for Drinking Water Supply and of the Facilities of the documentation pool of the Association of Dutch Water Supply Undertakings in which the Government Institute participates. According to the suggestions of the Advisory Board Meeting in December 1971, the establishment of proper documentation facilities should be accelerated. Since November 1971 Mr. T.K. Tjiok, the new full-time staffmember, is in charge of information and documentation.

Provision of Information

During 1971 approx. 900 letters were received in which information was requested on various subjects.

Among many others, requests were received from:

- Department of the Coordinator General of Public Works, Brisbane, Australia, on recovery of water from sand dunes.
- Volta Lake Research Project, Ghana, on techniques for bacteriological evaluation of water quality.
- Community Water Supply Unit, W.H.O., on planning and management of water supplies, with particular reference to the regrouping and amalgamation for technical maintenance and management purposes of small water systems.
- Cardiovascular Diseases Unit, W.H.O., on studies of possible relationship between mineral content in drinking water and incidence of cardiovascular diseases.
- University College London, on resistance of schistosoma cercariae to shear by fluid forces.
- Central Public Health Engineering Research Institute, Nagpur, India, on standard specifications for granular filter media.

Newsletter

In order to present the work of the Centre and of the Collaborating Institutions, and to develop contacts between the bodies and individuals engaged in community water supply I.R.C. Newsletters have been issued monthly.

The Newsletter covers the news from the Centre and the Collaborating Institutions and gives information on events and current activities in the field of water supply research and development. In May 1971, the first French edition of the Newsletter was issued. The mailing list for both the English and French edition was extended to approx. 1400 addresses.

In July, a questionnaire was prepared in order to improve the effectiveness of the Newsletter and was sent to approx. 1200 addresses. About 300 answers were received in which suggestions concerning fields of interest, new addresses and lay-out were given. The results were evaluated and will be applied in future editions.

Publications and papers

Two bulletins and a technical paper were issued in 1971 (see under Research Coordination).

For the Ninth International Water Supply Congress, to be held in New York in 1972, a paper was prepared, entitled "Water Supply Situation in Developing Countries and the Contribution of the W.H.O. International Reference Centre for Community Water Supply", to be presented at the Session of the Standing Committee on Problems of Water Supplies in Developing Countries.

5.2 Research Coordination

Inventory of research projects

Several branches of science and engineering are involved in water supply problems and technology and the research related to community water supply is conducted in several fields. Research is performed by various bodies: research institutes, centres and associations, national and international agencies and organizations, universities, graduate schools, teaching institutes, etc. The research activity is conducted within the intramural and contract research projects. The projects are sponsored by various bodies. To avoid unnecessary duplication of effort and to ensure the maximum effectiveness, planning and coordination of research activity is needed.

Against this background, efforts to arrive at systematic research coordination in the water supply field were started.

As a first step, an inventory of research projects, carried out by Collaborating Institutions was elaborated. The information was gained by means of forms circulated to the 28 Collaborating Institutions in January 1972, the last of which were received back in June. A total of 242 research projects were carried out in 1971. As 17 of 28 Collaborating Institutions are universities, teaching institutes and graduate schools of engineering, they are often handicapped by small staffs available for research activities, and the general practice is to use students to carry out research projects under the guidance of the faculty staffmembers.

For inventory purposes, a general classification of community water supply topics was composed. The topics have been divided into the following six groups:

1. Water supply general
2. Water quality
3. Water catchment
4. Water transmission
5. Water treatment
6. Water distribution

All research projects have been classified accordingly. The inventory was issued as Bulletin no. 1 entitled: "Community Water Supply Research 1971". After announcement in the I.R.C. Newsletter, many requests for the Bulletin have been received.

The inventory of research projects conducted in the field of community water supply was extended to institutions not officially collaborating with I.R.C., and which main function is the performance of research. A questionnaire together with the Bulletin no. 1 was sent to 70 selected institutions. More than 50 per cent of the institutions gave response and sent the information about their research activity in the water supply field. A bulletin covering this inventory will be issued in 1972.

Plastic pipe in distribution practice

Distribution networks absorb the major share of capital investment and manpower in community water works. There are several kinds of pipe commonly used in drinking water distribution practice. Certain types of plastic have been evaluated as suitable material for pipes conveying water, provided that adequate precautions against possible toxicity hazards are observed during manufacture. Intensive research has been carried out in the field of plastics. Several Collaborating Institutions are involved in studies on various aspects of the use of plastic pipe in drinking water supply.

In order to introduce the subject and to initiate research cooperation, Technical Paper no. 1 entitled "Plastic Pipe in Drinking Water Distribution Practice" has been elaborated, which contains a bibliography concerning this subject and which can serve as a guide to the literature dealing with application and development. The titles of non-English language papers in this bibliography have been translated into English. The paper has been issued and distributed to the Collaborating Institutions and other bodies engaged in problems of plastic pipe. After announcement in the I.R.C. Newsletter a great number of requests for this publication have been received.

By means of this Technical Paper no. 1, contacts with many institutions interested in water plastic pipe were made; among those were contacts with standards institutions and national waterworks associations in many countries. Technical data, standards, guidelines and papers on water plastic pipe have been received, and will be summarized in a second paper on the subject.

Initiating of further subjects

Sedimentation processes, filtration and disinfection of water are the basic techniques in drinking water treatment. Continuous investigations are carried out on these subjects in all parts of the world. Various aspects of these water treatment techniques have been investigated by the Collaborating Institutions. In order to obtain the project details, questionnaires have been forwarded to the Collaborating Institutions, on above mentioned subjects. Till the end of the reporting period about 60 per cent of the ~~filled-in~~ questionnaires have been received.

Water pollution index

In order to be able to compare the problems connected with river water as a source of drinking water in different parts of the world, I.R.C. has initiated a study concerning the set-up of a "water pollution index" as a general criterion of the degree of pollution of a river. Collection of data has been started according to a programme worked out by Mr. B.C.J. Zoeteman of the Chemical and Biological Department of the Government Institute. A questionnaire has been sent to 260 institutions in 72 countries.

5.3 Design Coordination

Iodine device

On behalf of the W.H.I., simple dosing devices for iodine disinfection of water in open wells have been studied by the Netherlands Government Institute for Drinking Water Supply. In 1971 the devices were tested under field conditions by the Central Public Health Engineering Research

Institute, Nagpur, India. Several experiments with the devices were carried out, new aspects were discovered and a number of questions was raised.

The gained data will be used in future work. A report on the use of iodine as a disinfectant will be published in 1972.

5.4 Education and Training

Training courses

Problems of manpower and personnel policy play an important role in community water supply. Planning, design, construction, supervision, management, operation, maintenance and surveillance of community water supplies demand the service of trained personnel. In order to meet the demands for qualified personnel, education and training courses at various levels are organized by education institutions and different bodies involved in water industry.

Within its activity the Centre is collecting information on the present picture of education and professional training in the community water supply field. In 1971 data on training courses and programs offered by institutions collaborating with I.R.C. were collected by means of a questionnaire, elaborated and published in the Bulletin no. 2 entitled: "Training Courses in Community Water Supply 1971". The courses offered by the Collaborating Institutions have been divided into the following groups:

- university grade courses
- courses for engineering and professional staff
- courses in operation of plants
- courses for skilled labour.

In the year 1971 a total number of 94 courses was organized by the Collaborating Institutions.

Cooperation with the I.W.S.A. concerning Education and Training

I.R.C. took part in meetings of the Working Group of the Standing Committee on Education and Training of the International Water Works Association (see under visits).

6. PLANNED ACTIVITIES FOR 1972

Assuming that in the course of the years 1972 and 1973 the I.R.C. staff will be extended and the required budget will be available, the following priorities have been set for 1972.

6.1 Information and Documentation

- First priority in this section is the set-up of a documentation storage and retrieval system including documentation of books, papers, reports, reviews, conference proceedings, etc. Contacts with abstracting services and documentation centres will be laid. It will be strived after to extend informational services concerning literature, literature surveys and technical designs as well as on institutions and agencies working in the field concerned.
- The publication of Newsletters will be continued. The sources from which relevant information on community water supply subjects and related fields can be obtained, will be extended.
- Translation services will be started.
- The information on research and development projects will be extended and further bulletins on those as well as on education programmes will be published.
- A start will be made with the updating of existing publications.
- A paper on the water supply situation in developing countries and the contribution of I.R.C. will be presented at the Congress of the International Water Supply Association in New York.

6.2 Research Coordination

- In cooperation with W.H.O., Water Research Association, England, Testing and Research Institute of the Netherlands Waterundertakings KIWA Ltd., The Netherlands, National Sanitation Foundation, U.S.A., Central Public Health Engineering Research Institute, India and a number of other institutions and individuals, a meeting on toxicity of uPVC pipes and coagulant aids will be convened.
- The technical paper on plastic pipe will be extended with standards, characteristics, test methods, guidelines on design and installation, and development needs.
- The coordinative investigations on studies of designs and systems of filtration and disinfection will be summarized and published in technical papers.
- A start will be made with a review of research needs and in consultation with the Collaborating Institutions, subsequent recommendations will be given on projects to be carried out. For special subjects it will be tried to arrive at the initiating of twin institutions.

6.3 Design Coordination

- A report will be issued on the use of iodine as a disinfectant.
- A series of papers on simple design for treatment of raw water will be initiated.
- A start will be made with the evaluation of existing equipment and designs.
- It will be tried to arrive at a survey of design criteria, water needs, consumption and water prices in urban areas.
- Basic principles of artificial recharge will be published.
- A study of application of designs in water supplies, using locally available materials will be continued.

6.4 Education and Training

- The I.R.C. will form a starting point for foreign WHO fellows and visitors, who wish to study local research projects and water supplies.
- Information on training and education programmes will be collected and disseminated.
- In cooperation with the International Water Supply Association, a start will be made with evaluation of programmes, and needs and methods of education will be studied.
- The organization of meetings and training courses will be promoted.

Everyday the housewives meet when fetching water in Dakar.
A pleasant occasion - but it may be a long way to go.

WHO photo by M. Jacot



7. VISITS AND OCCASIONS

7.1 Visitors received

The Centre welcomed a number of experts and specialists in the field of community water supply during the year, who made brief visits. Among those were noted the following:

- | | |
|----------------------|--|
| Mr. M. Reynders | - La Direction Générale REGIDESO,
Kinshasa, Rep. Dem. Congo. |
| Prof. E.W. Mood | - Dept. of Epidemiology and Public Health,
School of Medicine, Yale University,
New Haven, Connecticut, U.S.A. |
| Dr. W.E. Hanford Jr. | - President World Water Resources Inc.
New York, U.S.A. |
| Prof.Dr. K.E. Hakim | - Institute of Public Health,
Alexandria, United Arab Republic. |
| Mr. H.R. Wasmer | - Manager, W.H.O. International Reference
Centre for Wastes Disposal, Dübendorf,
Switzerland. |
| Mr. J. Dvir | - Laboratory Director, Mekoroth Water
Company, Benei-Brak, Israel. |
| Prof.Dr. R. Labonté | - Sanitary Engineering Center, International
Sanitary Engineering Course, Rabat,
Morocco. |

with students:

- | | |
|-------------------|--|
| Mr. A. Azizi | |
| Mr. M. Belayachi | |
| Mr. El A. Raad | |
| Mr. D. Mumba | |
| Mr. G. Kayanga | |
| Mr. A. Klaase-Bos | - Ministry of Agriculture, Nairobi, Kenya.
At present: Institution for Social-econo-
mical studies of developing territories,
University of Amsterdam, The Netherlands. |
| Dr. E. Vokounová | - Institute of Hygiene and Epidemiology,
Prague, Czechoslovakia. |

7.2 Visits paid

Mr. Th.G. Martijn, I.R.C. Manager and Mr. J.M.G. van Damme, Assistant Manager, visited the W.H.O. International Reference Centre for Wastes Disposal in Zürich, Dübendorf, Switzerland in February. The discussions

included general matters such as: both I.R.C.'s approaches, organizations and activities, the respective Newsletters, the documentation system at I.R.C.-Zürich and ways of cooperation.

Mr. T. Verheul, Director of the Centre, attended the meeting of the Steering Committee on Water Supply Problems in Developing Countries of the International Water Supply Association which was held in Nice in April. On the meeting attention was paid to the programme of the Session of the Standing Committee on Problems of Water Supplies in Developing Countries during the Congress in New York in September 1972.

Mr. Verheul was elected a member of the Standing Committee. The chairman of the Committee, at the same time vice-president of the I.W.S.A., Mr. F. Merryfield, was invited to take part in the meetings of the Advisory Board of the I.R.C.

On the same occasion Mr. Verheul attended a meeting during which the Standing Committee on Education and Training of Waterworks Personnel of the I.W.S.A. was established. In his capacity of Director of I.R.C. he was elected a member. The chairman of the new Committee, Mr. S.G. Barrett, was invited to become a representative in the Advisory Board of the I.R.C. On the meeting attention was paid to the agenda of the Committee at the Congress in New York in 1972.

Mr. Martijn participated at the "Symposium on Water Resources" held at Bangalore, India in May.

On the same occasion visits were paid to:

- The Central Public Health Engineering Research Institute, Headquarters, Nagpur, India (see chapter 2.4)
- The Central Public Health Engineering Research Institute, Zonal Centre, Bombay.
- The Bombay Municipal Cooperation, Bombay.
- The Victoria Jubilee Technical Institute, Bombay.
- The Regional Office of the World Health Organization, New Delhi.

The visit was experienced as a valuable contribution to a better understanding in many problems of mutual interest between I.R.C., the Collaborating Institutions and W.H.O. The impact of the problems to be encountered in India showed again the necessity that I.R.C. should pay the utmost attention to the developing countries.

Mr. A. Kepinski visited the Pro-Aqua Pro-Vita Exhibition and attended the Technical Meetings Pro-Aqua Pro-Vita 71 in Basel, Switzerland in June, where an impression of new developments in the field was acquired. Several new contacts were made and interesting agreements were arranged. On the same occasion Mr. Kepinski paid a visit to I.R.C. Zürich.

In August Mr. Th.G. Martijn visited Geneva for the meeting of W.H.O. Scientific Group on "Standardization of Techniques for the Collection

and Reporting of Data on Community Water Supplies" as ^{or} temporary adviser. The necessity of such a meeting can be concluded from a statement in the W.H.O. progress report 1970: "Most countries select their water supply and sewerage projects on an ad hoc basis in the absence of reliable data to define national objectives and priorities for the construction of water supply and sewerage facilities".

During the meeting time was devoted to discussions concerning existing data collection systems, needs and purposes of data, methods and techniques of collection, compilation and dissemination of data.

In August/September Mr. van Damme participated in "The Symposium on Soil Water Physics and Technology" at Rehovot, Israel. On the same occasion visits were paid to the Collaborating Institutions in Israel and Turkey (see Chapter 2.4) and to:

- Ministry of Health, Central District Dept., Ramle
- Mekoroth Water Co. Ltd., Tel Aviv
- Municipal Water Supply, Jerusalem
- Water Commissioners Office, Tel Aviv
- TAHAL Water Planning for Israel Ltd., Consulting Engineers Ltd., (several departments), Tel Aviv
- Hydrological Service, Jerusalem
- Geological Survey, Hydrogeological Division, Jerusalem.

Many contacts were made and many institutions promised future contribution. Water supply in Israel has been well planned and organized and contacts with Israeli research workers and officials may lead to an efficient solving of a number of problems met by I.R.C. It appeared from the visits that I.R.C. meets a ~~want~~ ^{need} and I.R.C.'s activities were highly appreciated. In general it was again felt that I.R.C. staffmembers should travel to sense problems and solutions on the base of a sound but broad knowledge of practice and theory, to lay contacts, to broaden the experience and to create faith.

In September Mr. Martijn visited Tadley Court in Great Britain, for the meeting of the Working Group of the International Standing Committee on Education and Training of the International Water Supply Association. On the meeting a programme for the Committee's Session at the forthcoming Congress in New York was discussed and it was decided to form an expert panel which can lead the discussions there. Further discussions concerned the organization and development of the education and training of waterworks personnel and a technical nomenclature and definitions.

In November Mr. Martijn visited Geneva for the meeting of the Working Party of the I.W.S.A. Standing Committee on Education and Training, following the meeting in Tadley Court. A decision on a glossary of terms

on education and training was reached and a start was made with the elaboration of a questionnaire on education and training programmes. Another visit by Mr. Martijn to Geneva was paid for the meeting on methods of waste water treatment and health safeguards in relation to the reuse of effluents. It was concluded that there is a definite need for further action and that guidelines on the ways of treatment should be prepared.

7.3 Lectures and publications in periodicals.

The lecture "Water; where are we going" of Mr. T. Verheul at the 1970 Public Works and Municipal Services Congress and Exhibition in London at the Session on "European Conservation Year 1970", was published in a Final Report of the Public Works and Municipal Services Congress and Exhibition Council.

Mr. Th.G. Martijn gave a lecture for staffmembers and co-workers at the Central Public Health Engineering Research Institute, Nagpur, India entitled "The Netherlands masterplanning and I.R.C." in May.

Mr. J.M.G. van Damme held a lecture on "Community Water Supply situation in developing countries and the contribution of I.R.C." for staff and students of the Hydrological Department, Institute for Earth Sciences, Free University, Amsterdam, in November.

Mr. van Damme reported on the 2nd Conference on Water Quality and Technology, Budapest, Hungary, 1970 in H₂O (4) nr. 11.

The two following papers have been published by Mr. A. Kepinski:

- International cooperation in the field of water management: Die Wasserwirtschaft No. 1, 1971 (in German).
- Suggestions to water balance of subsurface waters: Wasser und Boden No. 9, 1971 (in German).

8. PUBLICATIONS

8.1 I.R.C. Technical papers and bulletins published in 1971

Technical papers

1. Plastic Pipe in Drinking Water Distribution Practice

The paper contains basic information on the use of plastic pipe in community water supply. It presents a short summary of properties of plastic pipe and the advantages and drawbacks to its use for the transmission of drinking water, and serves as a guide to literature on plastic piping materials, their influences on water quality, test procedures, and plastic pipe main design, laying, tapping and maintenance. The aim of the paper is to collect and disseminate subsequently, information on the present knowledge of the subject and to arrive at a production of standards and guidelines which will be published in a later stage.

Bulletins

1. Community Water Supply Research 1971

The bulletin covers research in the community water supply field and classified research projects carried out in 1971 by 28 institutions collaborating with I.R.C.

The aim of the paper is to enable research workers to come into contact with colleagues and to arrive at an extensive exchange of research findings and programmes.

2. Training Courses in Community Water Supply 1971

This bulletin covers courses and programs offered by the collaborating institutions. Course name, language, sponsor, pre-requisite for admission, degree or diploma or certificate awarded, duration of the course, maximum number of participants, number of courses held and course fees, are given.

A further official I.R.C. publication is the monthly Newsletter. A free of charge subscription can be ordered at the I.R.C.

An unofficial publication is a monthly unclassified list of publications received by the I.R.C. library. A limited number of copies are available upon request.

8.2 Papers of other bodies and institutions available at I.R.C.

A limited number of the following papers are at present available free of charge at I.R.C.:

Water Supply

World Health Organization CWS/RD/69.1: "The Village Tank as a Source of Drinking Water".

WHO/CWS/72.3: "A portable unit for the supply of drinking water in emergencies (Kenya)".

Water and Environmental Hygiene

WHO/CWS/RD/70.2 - "Health Hazards of Coagulant Aids".

WHO/CWS/RD/70.3 - "Schistosomiasis and Community Water Supplies".

WHO/EH/70.1 - "Cholera Control through Environmental Sanitation".
(also in French)

WHO/CWS/71.1 - "The Control of Water-borne Epidemics through the improvement of Community Water Supply".

WHO/CWS/71.2 - "WHO Expert Committee on Health Criteria for Water Supply".

WHO/CWS/71.5 - "Identification and Evaluation of the principal acute and long term effects of environmental agents on man's health incl. genetic effects".

Central Public Health Engineering Research Institute, Nagpur, India:
"Disinfection for Small Community Water Supplies".

CPHERI, Nagpur, India "Rural Sanitation"

CPHERI, Nagpur, India "Defluoridation".

Water Supply Planning

WHO/CWS/RD/70.5 - "National Rural Water Supply Programme"

WHO/CWS/71.5 - "Community Water Supply Research and Development Programme" (also in French)

Report of the Proceedings of the International Conference on Research and Development in Community Water Supply, Cavtat, Dubrovnik, Yugoslavia, October 7 - 14, 1970.

Filtration

WHO/CWS/RD/70.1 - "Biological or Slow Sand Filters"

CEPIS (PAHO/WHO)- "Expansion of Cucuta using Dual Media Filtration".

List of Collaborating Institutions

as of 1 January 1972

1. Office de la Recherche Scientifique et Technique Outre-Mer
Service Central Hydrologique
19, Rue Eugène Carrière
71 PARIS-18e
France

2. The Water Research Association
Ferry Lane, Medmenham
MARLOW, BUCKS. SL7 2HD
England

3. Sanitary Engineering Laboratory
Middle East Technical University
ANKARA
Turkey

4. Consiglio Nazionale delle Ricerche
Via Reno 1
ROME
Italy

5. Centre of Sanitary Engineering
The University of Naples
Via Claudio 21
NAPLES
Italy

6. Testing and Research Institute of the
Netherlands Waterundertakings KIWA Ltd.
Sir Winston Churchilllaan 273
RIJSWIJK Z.H.
The Netherlands

7. Department of Civil Engineering
University of Newcastle upon Tyne
Claremont Road
NEWCASTLE UPON TYNE 2
England

8. The Institute of Hygiene
The University of Aarhus
Universitetsparken
DK-8000 AARHUS C
Denmark

9. Faculty of Engineering and Architecture
University of Khartoum
KHARTOUM
Sudan

10. Sanitary Engineering Department
Faculty of Engineering
The University of Alexandria
ALEXANDRIA
U.A.R.

11. Hebrew University
Hadassah Medical School
JERUSALEM
Israel

12. Water Quality Office
Environmental Protection Agency
Crystal Mall Bldg. 2
WASHINGTON D.C. 20242
U.S.A.

13. Department of Environmental Sciences and Engineering
School of Public Health
University of North Carolina
CHAPEL HILL, NORTH CAROLINA 27514
U.S.A.

14. Department of Environmental Engineering
College of Engineering
University of Florida
GAINESVILLE, FLORIDA 32601
U.S.A.

15. Instituto de Engenharia Sanitaria
Rua Fonseca Teles 121 - 15º andar
RIO DE JANEIRO
Brazil

16. Department of Sanitary Engineering
Central University of Venezuela
CARACAS
Venezuela

17. National Sanitation Foundation
2355 West Stadium Boulevard
ANN ARBOR, MICHIGAN 48106
U.S.A.

18. Civil Engineering Department
Faculty of Engineering
University of Science and Technology
KUMASI
Ghana

19. Faculty of Engineering
University of Lagos
LAGOS
Nigeria

20. The Victoria Jubilee Technical Institute
Matunga
BOMBAY
India

21. Department of Environmental Engineering
Asian Institute of Technology
P.O. Box 2754
BANGKOK
Thailand

22. Department of City Planning and Sanitary Engineering
University of Tokyo
Hongo 7-3, Bunkyo-ku
TOKYO
Japan

23. The All-India Institute of Hygiene and Public Health
110 Chittaranjan Avenue
CALCUTTA
India

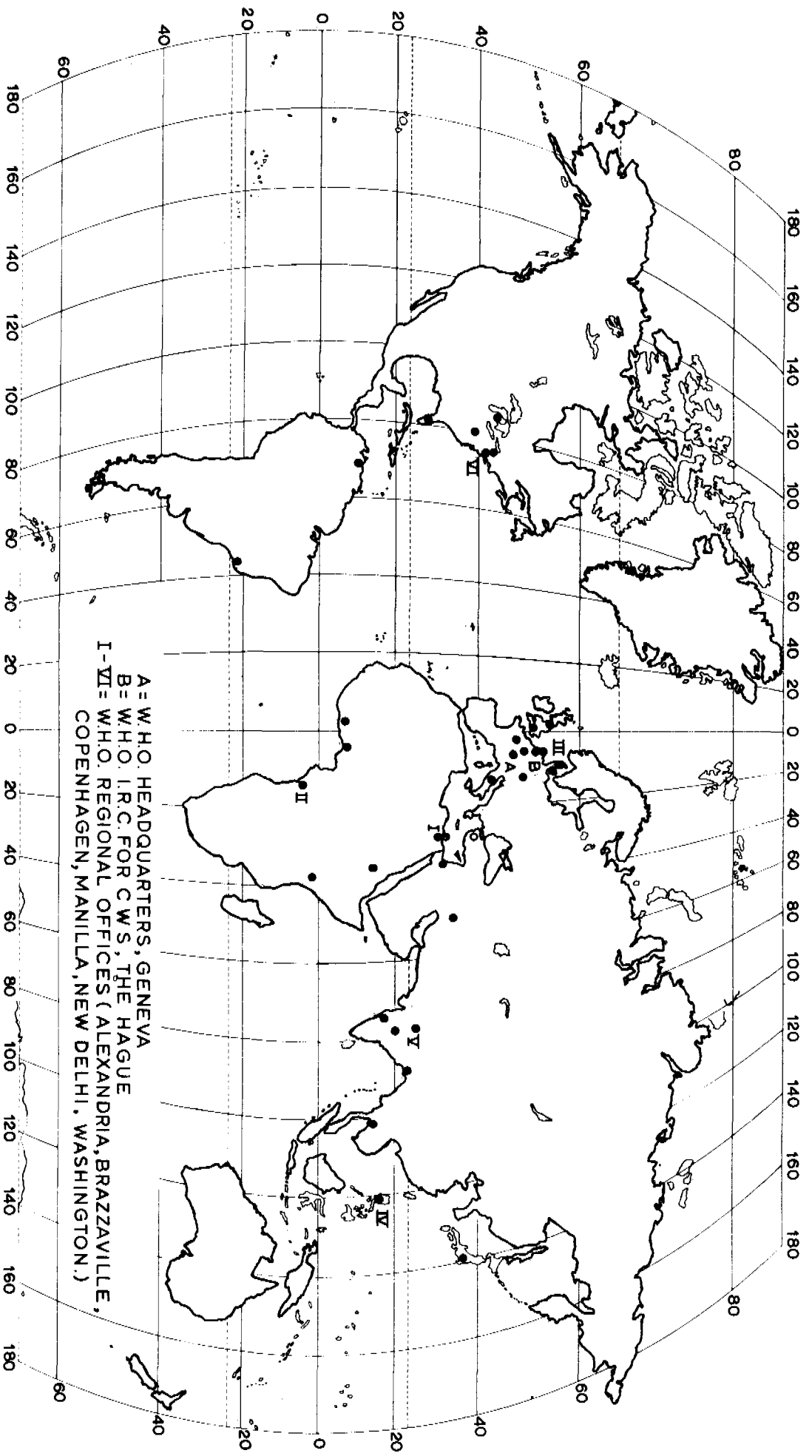
24. Central Public Health Engineering Research Institute
Nehru Marg
NAGPUR-3
India

25. Institute of Hydro Sciences and Water Resources Technology (IHT)
64 Ghadessi Street
TEHERAN
Iran

26. Centre Belge d'Etude et de Documentation des Eaux CEBEDEAU
2, Rue Armand Stévert
LIEGE
Belgium

27. Faculty of Engineering
University of Nairobi
NAIROBI
Kenya

28. Department of General and Environmental Hygiene
The Institute of Hygiene and Epidemiology
Srobarova 48
PRAGUE 10
Czechoslovakia



A = W.H.O. HEADQUARTERS, GENEVA
 B = W.H.O. I.R.C. FOR CWS, THE HAGUE
 I-VI = W.H.O. REGIONAL OFFICES (ALEXANDRIA, BRAZZAVILLE,
 COPENHAGEN, MANILLA, NEW DELHI, WASHINGTON.)