who international reference centre for community water supply

the hague, the netherlands
parkweg 13, telephone 070 - 514441

newsletter

Nr. 1 - December 1970

FIRST NEWSLETTER

In December 1968 the Government Institute for Drinking Water Supply in The Hague was designated by WHO as the International Reference Centre on Community Water Supply. Since then time was used for building the Centre up and for making the necessary financial arrangements.
This letter will bring periodically brief information on the various activities of the I.R.C. and the Collaborating Institutions. Till now, 24 institutes spread all over the world, have been designated by WHO as a Collaborating Institution.

INT. CONFERENCE ON RESEARCH AND DEVELOPMENT IN COMMUNITY WATER SUPPLY WAS HELD IN DUBROVNIK

An International Conference on Research and Development in Community Water Supply, sponsored jointly by the Governments of Yugoslavia and of the United States of America, and by the World Health Organization was held in Cavtat, Dubrovnik, Yugoslavia in October last.

The purpose on the Conference was to bring together leading scientists in the water supply field to discuss and co-ordinate research and development policies and practices, so that a co-ordinate approach can be made to these problems.
For that purpose a world-wide network of collaborating research and development institutes has been established together with the WHO International Reference Centre at the Netherlands Institute for Drinking Water, The Hague, Netherlands. IRC was represented at the conference a.o. by its director and 3 members of the staff. The report of the conference will be published in due time.
The Conference attracted world-wide interest, as was shown by the number of Directors of Research Institutions from all over the world who were numbered among the participants. Some 60 participants and observers from 31 countries attended the conference.
Matters of topical interest, such as the increasing pollution of the world's water supplies and the spreading menace of waterborne epidemics including cholera, were discussed, together with the more fundamental problems of the developing countries.

NEWS OF COLLABORATING INSTITUTIONS

ESTIMATION OF RESIDUAL CHLORINE IN WATER

The Central Public Health Engineering Research Institute, Nagpur, India has developed a simple kit for estimation of residual chlorine in water. The CPHERI will be holding a training course in "Water and Waste Analysis" (8 weeks duration) beginning 7th January 1971 to 27th February 1971 at Nagpur. Graduates in Chemistry or Biology are eligible for this course.

NEW PROGRAMME AT THE WATER RESEARCH ASSOCIATION, ENGLAND

The British Government has allocated £ 219,000 sterling over 3 years to support a research programme concerned with rivers and their water quality in relation to effluent discharge and their subsequent re-use for public water supply.
The research, starting now, falls under five main headings:
1. Characterisation and measurement of organic and inorganic contaminants in river water.
2. Prediction of the risk of eutrophication when a river water is impounded.
3. Interference in chlorine disinfection caused by ammonia.
4. Rapid identification of plumbing fitting.
5. Dezincification of plumbing fittings.

All information derived from this work will be released through the Association's usual membership channels by way of publications and symposia.

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STANDARDS

During October 1970, Charles A. Farish, Executive Director of the National Sanitation Foundation, Ann Arbor, Michigan, visited the WHO International Reference Centre while he was in The Hague for conferences with officials of KIWA.
Mr. Farish had been conferring with WHO officials in Geneva and later visited the WRA Laboratories in England. At each of these places, Mr. Farish reviewed the concerns of the National Sanitation Foundation in regard to the establishment of uniform testing procedures for determining the levels of heavy metal extraction from plastics. It is the firm conviction of the Foundation, based on some fifteen years of testing experience, that such heavy metal extractions as lead, cadmium, antimony and other toxic elements should not be permitted in plastic formulations if the extraction levels exceed those levels set forth in the International Standards for Drinking Water as published by WHO in 1963.
It has been indicated to WHO that any standards that they might recommend for developing countries should certainly be equal to or more rigid than the International Standards, since it is doubtful that in some instances developing countries would be able to assure the same levels of quality control in the production of their products as countries that have been producing these materials for many years

YOUR LIBRARY

The British National Book Centre puts libraries wanting books and journals in touch with other libraries that have spare ones which they are ready to give away. Membership of the Centre is open to overseas libraries as well as British; the current subscription is £ 8.10.0 d., sterling per annum. Members receive each month lists of books and journals available.
Libraries wanting items offered, notify the Centre which passes on requests to the offering libraries. These then, send the material direct to the requester, who refunds the donor's postage and packing charges; there are no other costs.
For membership of the Centre and full details of the service, write to:
The Superintendent, British National Book Centre, National Central Library, Store Street London WCIE 7 DG - England.

TESTING OF PRESSURE TYPE GAS CHLORINATORS

Two types of gas chlorinators, produced by "Hidrosanitas", Belgrade, Yugoslavia were tested in the field by the Sanitary Engineering laboratory at the Civil Engineering faculty, University of Belgrade. The tests covered suitability of materials applied, performances, durability. Good results, after four years of work, if used by skilled people and if timely and properly serviced.

FIELDS-TESTS ON PITTING CORROSION OF COPPER TUBES

In cooperation with the Government Institute for Drinking Water Supply, the Testing and Research Institute of the Netherlands Waterundertakings KIWA ltd., has carried out an extensive field-test on pitting corrosion of copper tubes. The resistance against pitting corrosion was investigated for 13 representative Dutch water compositions and for the following types of copper: high phosphor deoxydised copper; phosphor-arsenic deoxydised copper and electrolotic non-reduced oxygen containing copper (tough-pitch copper).
At the same time the effect of 5 different surface treatments on the condition of the internal surface of the pipe (bore condition) and the influence on the resistance against pitting corrosion for the three types of copper already mentioned have been studied. Significant influences of temporary hardness and oxygen contant in relation to the type of copper and bore condition have been determined. Only high phosphor deoxydised copper tubes which are internal clean and smooth appeared to have good resistance against pitting corrosion in all water compositions concerned in the field-test-programme. For Dutch circumstances the temporary hardness of the water supplied has to be at least 2,8 German degrees, whereas it is recommended that the oxygen content of the water in case of very low hardness, does not exceed 8 ppm. The maximum contamination with carbon of the internal surface of the pipe proved to be 0,3 to 0,4 mg/dm^2 watertypes having a very low temporary hardness. However, it has been proved that contamination of carbon does not cause pitting corrosion in every water composition studied.

For further information concerning the contains of this newsletter, please contact I.R.C. The Hague, The Netherlands.

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Nr. 2 - January 1971

NEW COLLABORATING INSTITUTIONS

The following Institutions have become a member of I.R.C.:

Institute of Hydro Sciences and Water Resources Technology, Teheran, Iran;
Centre Belge d'Etude et de Documentation des Eaux, 2 rue Armand Stévart, Liège, Belgium;
Faculty of Engineering, University College, Nairobi, Kenya;
Institute of General and Communal Hygiene, Prague, Czechoslovakia.

FIVE YEARS PROGRAMME APPROVED BY ADVISORY BOARD

I.R.C.'s Advisory Board recently gave its approval to a five years programme, in which are stated the objectives and activities for the near future. For the meeting of this board the following representatives of collaborating institutions were invited:

Dr. R.G. Allen, Director of the Water Research Association, England;
Mr. T.M. Aluko, Senior Research Fellow of the University of Lagos;
Prof. S.J. Arceivala, Director of the Central Public Health Engineering Research Institute, Nagpur, India;
Dr. Hamid Ibrahim Hamid, Head Civil Engineering Department of the Faculty of Engineering, Khartoum, Sudan.

Dr. Allen attended the December-meeting of the Board, in which the five years programme was discussed and approved. WHO was represented by Mr. W.E. Wood, Chief Community Water Supply Unit Division of Environmental Health.

Florida

FEASIBILITY OF TREATING WASTEWATER BY DISTILLATION

A study of the parameters affecting effluent water quality of distilled domestic wastewater has been conducted by J.H. Sullivan under the direction of J.E. Singley of the Department of Environmental Engineering, University of Florida. It will be published by the FWQA, the Water Pollution Control Research series as ORD 17040 DNM 11/70, "Feasibility of Treating Wastewater by Distillation". They have shown that satisfactory potable water can be produced from treated wastewater by distillation followed by carbon adsorption.

Uganda

THE TOXICITY OF FREE CHLORINE TO BILHARZIA CERCARIAE

Last year members of the Government Chemist's Department in Kampala and the Zoological Department of Makerere University (Uganda) carried out studies and tests on the toxicity of free chlorine to Bilharzia Cercariae. The object of the tests was to verify the effectiveness of chlorination as a protective measure against infection. Three variables were introduced, namely free chlorine residuals ranging from 0.25 to 0.75, pH concentrations ranging from 5.5 to 8.5 and different strains of Cercariae from the West Nile and the Sudan. A short paper on the results of the tests is available at I.R.C.

Israel

SIMPLE FIELD TEST FOR CHLORINE RESIDUAL

An American Company has developed a test strip which can be immersed into water and which shows within 30 seconds, by means of a change in colour, the chlorine residual and the pH. The price of the strip is approximately 20 - 25 cents a piece and can be kept for a maximum period of 18 months.
Prof. Hillel I. Shuval, Hebrew University - Hasassah Medical School, Jerusalem, is in contact with the firm and aims to check the strip in his laboratory and under field conditions.

Taiwan

ARSENIC - REMOVAL TREATMENT IN COMMUNITY WATER SUPPLY OF BLACK-FOOT DISEASE AREA

In Taiwan, an endemic disease, the black-foot disease is prevalent along the southwestern corner of the island. According to statistical data, there is a close correlation between the high arsenic content in the drinking water and the disease. A simple water supply plant serving 1,000 people, established by the Institute of Environmental Sanitation is using arsenic removal treatment as an experiment. The method of treatment includes aeration, pre-chlorination, ferric chloride coagulation, sedimentation and filtration. The dosage of free available chlorine is 15 mg/l, and of $FeCl_3$ 30 mg/l. The arsenic content in raw water is

0,6 mg/l. After treatment no remaining arsenic is present in the purified water. The cost of treatment is US $ 0.05 per M^3 day.

Israel

CHOLERA

During the recent local cholera outbreak in Jerusalem during September 1970, the Environmental Health Laboratory of the Hebrew University- Hadassah Medical School was requested by the Ministry of Health to assist in environmental monitoring for cholera organisms. The laboratory mobilized its staff for this purpose and initated a programme for sampling sewage, water and sewage irrigated vegetables and soil. An effective method for detecting cholera organisms in one-liter-samples of sewage was developed. During the epidemic the laboratory was able to prove the presence of cholera organisms in sewage samples from all areas of the city. They also isolated cholera organisms from a sample of soil taken from an area where vegetables were grown under sewage irrigation. This work proved to be a major contribution in identifying one of the primary routes of dissemination of the cholera organisms: the irrigation of vegetables with sewage. No samples of drinking water were found to be positive for cholera organisms, although samples as large as 85 liters were tested with the membrane filter method. Professor H. Shuval, Director of the Laboratory, has stated that in his opinion, water laboratories throughout the world should prepare themselves for environmental monitoring work, in preparation for the possible spread of the disease to areas that have been free of the disease for many years. The recent cases of cholera in the Middle East and Eastern Europe are suggestive of the problems that may arise in the future even in areas with high levels of sanitatior

Denmark

INVESTIGATIONS OF NUISANCE BACTERIA

The institution of Hygienic at Aarhus, Denmark, is interested in the examination of nuisance bacteria with regard to taxonomy and biochemical properties. Nuisance bacteria are understood to be bacteria that may cause tastes and odours, destroy different materials or are detrimental to the routine bacteriological examinations.

Venezuela

UPFLOW FILTRATION

The Department of Sanitary Engineering of the Universidad Central de Venezuela has started with research on "Limiting Velocity of Filtration in upflow units - Incipient and partial fluidization of the bed".

PILOT WASTEWATER TREATMENT PLANT

The Programme "Sanitary Engineering Education in Venezuela" (VEN-6400) with the collaboration of UNDP, the Government of Venezuela and the Pan American Health Organization, has initiated the construction of a pilot plant to study local (tropical) parameters for the application of standards of design in the field of sewage treatment.

Yugoslavia

TURBIDITY STANDARDS

In the Laboratory of Sanitary Engineering of Beograd, Yugoslavia, a new method has been developed for the preparation of the water turbidity standards, which is simple to prepare and has good reproducibility and stability. The standards are based on the emulsions of different phtalates in mixtures of water and appropriate alcohol.

CONGRESSES AND SYMPOSIA

12th Water Quality Conference. Subjects: "Virus and Water Quality Occurrence and Control". Urbana - Illinois, February, 15-16, 1971. Informatiom: V.L. Snoeyink, Ass. Prof. of Sanitary Eng., University of Illinois, Urbana, Illinois 6801, U.S.A.

International Symposium on Man-made Lakes, their problems and environmental effects (organized by COWAR on behalf of ICSU). Subjects: Water, Eutrophication, Pisciculture, Eartquakes, Recreation.
Knoxville - Tennessee - U.S.A., May, 3-7, 1971. Information: Prof. W.C. Ackermann, President Scientific Committee on Water Resources, Illinois State Water Survey, Box 232, Urbana, Illinois 61801, USA.

Symposium on Water Resources.
Bangalore - India, May, 1971. Information: Prof. K. Seetharamiah, Civil and Hydraulic Engineering Department, Indian Institute of Science, Bangalore 12, India.

5th Congress Pro Aqua Pro Vita 1971. Subjects: Sanitary Engineering, Water, Sewage, Refuse, Air, Noise.
Basel - Switzerland, June, 8-12, 1971. Information: Secr. Pro Aqua Pro Vita, Postfach CH 4000, Basel 21, Switzerland.

IASH Symposium on Pollution of Groundwater and Surface Water.
~~Moscou - USSR, July 28 - August 14, 1971~~. Information: M. ~~Jacquet~~, 5. Rue des ~~Batignoles~~, Paris, France; M. le Prof. Schoeller, Rue Louis Maydiere 33, Bordeaux, France.

AWRA Research Conference Planning for Water Quality and Standards.
Wisconsin - USA, June, 14-18, 1971. Contact: Dr. G. Karadi, General Chairman and Professor, Department of Applied Science and Engineering, University of Wisconsin-Milwaukee, USA.

AWRA National Symposium on Social and Economic Aspects of Water Resources Development.
Ithaca - USA, June, 21-23, 1971. Contact: Professor Leonard B. Dworsky, Director, Water Resources and Marine Sciences Centre, Cornell University, Ithaca, New York, USA.

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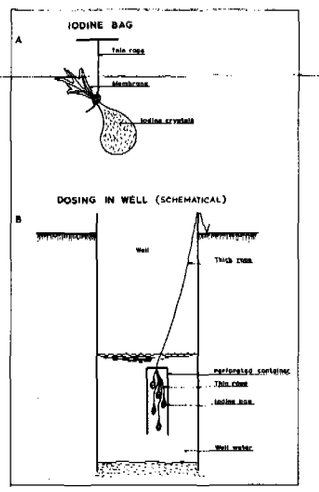
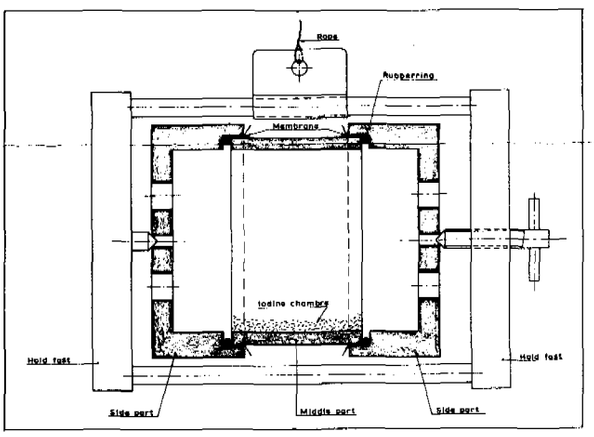
Nr. 3 - February 1971

IODINE DISINFECTION

On behalf of W.H.O., the Government Institute for Drinking Water Supply in the Netherlands is studying the suitability of elemental iodine as a disinfectant of drinking water. Unlike disinfectants like ozone, chlorine and bromine, iodine has some remarkable characteristics such as its solid state, relative chemical inertness and its effective disinfection over a wide range of pH values. The slow vaporization of crystalline iodine enables construction of a controlled, reliable dosing device. Comparison of elemental iodine with other disinfectants in solid form, like calcium hypochlorite, shows that when using iodine no clogging of the dosing device by solid deposits has to be feared. Iodine, if well packed, can be stored for years while active chlorine compounds decompose during storage. Iodine is widely used in the medical therapy of endemic goitre. Although adverse effects caused by a considerably higher intake of iodine than the daily requirement of about 0,1 mg can occur occasionally, complications during the iodine therapy of goitre are very infrequent. In contrast to these attractive properties there are some limitations to the use of iodine as a water disinfectant. Iodine is a scarce and expensive chemical. Because of these limitations the application of iodine as a water disinfectant will be restricted to emergency cases e.g. in times of disasters. During these times especially the water supply in developing countries from open wells will become of vital importance for the local population.



Two simple dosing devices, that can be lowered by a rope into such wells, have been developed. A drawing of the prototypes is given in the figures. The principle of these devices consists of iodine vapour diffusion through a special type of cellulose membranes which are watertight, but allow diffusion of iodine into the water. By varying the membrane surface area the iodine feed-rate can be controlled. It is the intention to have both devices tested under field conditions by two Collaborating Institutions: the Central Public Health Engineering Research Institute, Nagpur, India, and the Asian Institute of Technology, Bangkok, Thailand.



Japan

PROBLEM OF WATER SOLUBLE PLASTICS

Today, many countries have a problem with the disposal of plastics. Plastics mixed with refuse, damage, incinerators by producing high calories and poisonous gases. The Japanese chemical industry, however has recently produced an easily decomposable plastic film, made of polyvinil alcohol which can be used as a container and can be dissolved in water after usage. A chemist from Nagoy Water-works tried to remove this plastic material during water

purification. The removal of this water soluble material by coagulation, settling and sand filtration is about 20 percent, which would give rise to a big problem with regard to drinking water quality. If research proves that this material cannot further be removed and is toxic, action to prohibit the production of this kind of plastic materials might well be taken.

Norway

MEETINGS

The Norwegian Institute for Water Research held a meeting in December last year. The aim was to present some of the ongoing research projects and to get into closer touch with research workers and other concerned official authorities. There were 90 participants and the following research projects were presented:

. problems of sludge in water supply systems
. the effects on humus-containing water of Ultra-violet illumination
. EDP in the planning of water supply and drainage systems.

The Institute is involved in a project concerning the location of the first atomic power plant in Norway. Problems of special interest are: corrosion, thermal pollution and pollution by radioactive isotopes. The Institute is also involved in a Norwegian initiative aimed at stopping the dumping of persistent organic substances and heavy metals into the North Sea. The budget for 1971 is 7,6 million N.Kr. The income on assignments is estimated at 2,4 million N.Kr.

DOCUMENTS AVAILABLE FOR DISTRIBUTION TO OUR COLLABORATORS UPON REQUEST

WHO/CWS/RD/69.1 "The Village Tank as a Source of Drinking Water"
WHO/CWS/RD/70.1 "Biological or Slow Sand Filters
WHO/CWS/RD/70.2 "Health Hazards of Coagulant Aids"
WHO/CWS/RD/70.3 "Schistosomiasis and Community Water Supplies"
WHO/CWS/70.5 "National Rural Water Supply Programmes"
WHO/EH/70.1 "Cholera Control through Environmental Sanitation (also available in French)

U.S.A.

TRACE SUBSTANCES IN ENVIRONMENTAL HEALTH

A Conference on trace substances in environmental health is scheduled for Juni 29 - July 1, 1971 at the University of Missouri in Columbia. Conference topics include:

. Epidemiologic Methods in Environmental Health
. Environmental Pollution
. Metabolic Effects of Trace Substances
. Health Effect of Trace Substances
. Analytical Methodology of sampling and analyzing trace substances
. Geographical and Geochemical Relationship to Health and Disease.

Proceedings of the conference will be published in book form. For further information, contact the representative of the Conference on Trace Substances in Environmental Health, Dr. D.D. Hamphil, Chairman, 426 Clark Hall, University of Missouri, Columbia, Mo. 65201

The Netherlands

REMOVAL OF MANGANESE FROM GROUNDWATER

An investigation concerning the removal of the soluble bivalent manganese from water, sponsored by KIWA, has been carried out by Dr. ir. A. Graveland at the Technical University of Delft. This work has been published in Dr. Graveland's thesis entitled: "Removal of manganese from groundwater". It is common knowledge that purification processes being applied nowadays involve demanganization in most cases based on practical experience. So far very little was known about the mechanism of demanganisation. The aim of the investigation, as described in Dr. Graveland's thesis, is to get a better insight into the removal of the soluble bivalent manganese from the water by means of oxidation and separation of the insoluble oxides being formed. The investigation was restricted to the pH-range from 7.0 up to 9.6. Oxygen brought into water by aeration is used as an oxidant and bicarbonate/carbonate as a natural buffer. In the pH-range mentioned the homogeneous oxidation does not proceed spontaneously and a catalyst must be present for an appreciable oxidation velocity. Because the insoluble reaction product Mn_3O_4, hausmannite, is used as such a heterogeneous autocatalytic reaction occurs.

Based on the experiments carried out and on the considerations given a demanganisation rate equation has been derived in which both the chemical reaction velocity parameters and the physical mass transport parameters appear. The insight thus obtained will enable to rationalization of the processes as carried out in practice.

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Great Britain

OPEN DAY - WATER RESEARCH ASSOCIATION

The Water Research Association is holding its Open Day on the 30th April 1971 when its laboratories and all aspects of its research programme in the fields of water resource development, treatment and distribution will be on display to all who are professionally concerned with the development of potable and industrial water supplies.
Overseas visitors are particularly welcome and special arrangements are made to facilitate their arrival and accommodation.
For further information, please contact the Water Research Association, Ferry Lane, Medmenham, Marlow, Buckinghamshire SL 7 2HD, England. Telephone: Hambleden 282. Telegraphic Address: Water, Marlow, England.

THE BRITISH COMMITTEE ON NEW CHEMICALS FOR WATER TREATMENT

In 1966 the British Government set up a special committee to assess the possible health hazards of new water treatment chemicals, and to advise on regulatory measures needed. The Committee has been concerned up to now principally with coagulant aids and flocculants. A large number of these materials is now available, many of which have proved to be of considerable value in the clarification of water for public supply.
The Committee considers substances at the specific request of manufacturers or licencees. Such requests must be accompanied by full information (in confidence if necessary) on the intended use of the product, its chemical composition and specification, the method of manufacture and quality control and full toxicological data both on the product itself and any significant impurities. The Committee does not carry out toxicological tests, nor does it consider the technical merit of the product although manufacturers are asked to give some account of this to justify consideration of the product. Five statements have been published to date, the current one including the names of 26 products. Of these, 20 are products based on polyacrylamide, polyacrylic acid or acrylamide/acrylate polymers. By way of example, the conditions applicable to 17 of these products are as follows:

I. No bath must contain more than 0.05% acrylamide monomer.
II. The dose used must average no more than 0.5 mg/l and never exceed 1 mg/l.
III. An upper limit for the content of acrylamide monomer must be stated by the supplier for every batch.
IV. The method of analysis for acrylamide must conform to that described in the Water Research Association Technical Inquiry Report No. 171.

Israel

INACTIVATING ENTERO-VIRUSES BY OZONE

The Environmental Health Laboratory of the Hebrew University Hadassah Medical School, Jerusalem, has recently initiated studies supported by the Federal Water Quality Administration, USA, on the efficiency of ozone in inactivating entero-viruses in water and waste-water. Studies continue on developing sensitive quantitative methods for monitoring water supplies for viruses. The Phase Separation (PS) Method developed by the laboratory in recent years can check five-litre-samples for viruses and is capable of detecting as few as one or two virus infective units in one litre of water.

Denmark

EDUCATION AND STANDARDIZATION

A course of environmental health will be included in the education of technical enigineers in Denmark. The initiative for this step has come from the engineering students' organization and will greatly improve the recruitment of technicians within this field. A Danish State Committee works on the standardization of methods for bacteriological and chemical examination of drinking water. These standards will preferably be common to all Scandinavian countries.

U.S.A.

VIRUSES IN WATER

We received a Newsletter compiled by Mr. Norman A. Clarke from the Division of Water Hygiene, Robert A. Taft Sanitary Engineering Center, Cincinnati, about current investigations on

viruses in water. The paper gives a review on past and current research on this subject by Institutions in the United States of America, France, Germany, Israel, Denmark, South Africa, Great Britain, Australia, India and Czechoslovakia.

India

DEFLUORIDATION

As a result of intensive research, the Central Public Health Engineering Research Institute recently developed a new medium "Defluoron-2" for removal of fluorides from water. Defluoron-2 is a synthetic carbonaceous sulphonated material in granular form with bulk density 810/kg cu.m. Its F^- removal capacity is 620 mg of F^- /kg of medium (224 grains/cft). It can be used in an installation similar to a pressure-type filter. The bed of medium is kept at 0.91 m and the maximum operating surface flow rate is restricted to 8.6 c.m/sq.m of bed area per hour.

ICING OF WATER SAMPLES *

CPHERI has carried out intensive studies in order to answer the question whether the icing of water samples is really necessary. The study was spread over a period of 18 months during which a few hundred samples were analysed. Waters of different pollutional loads were examined for their coliform content, both by the Multiple Tube Dilution and Membrane Filter Techniques, immediately after collection and after storing these for different periods at atmospheric and refrigerated temperatures. The results of the tests indicated that treated water samples from the distribution system, which normally will have low coliform counts, if at all, need no icing during the interval between collection and analysis (upto 3 days). Even when the waters have a high coliform count originally, icing of samples is not necessary if the object of analysis is only to detect pollution since none of these samples will ever be declared unpolluted when they are stored at atmospheric temperatures for a period of upto 3 days. If the object is an accurate estimation of coliforms, however, icing of water samples is considered necessary.

* References: Indian Journal of Medical Research, 23, p.57-68 (1935); Water Research, 1, p. 309-316 (1967)

IDENTIFICATION OF RESEARCH AND DEVELOPMENT NEEDS

The Central Public Health Engineering Research Institute in India, organized a Conference to identify research and development needs in community water supply, wastes disposal and water pollution during 28 - 30 January 1971 which was well attended by those concerned from various professional disciplines.
Encouraging suggestions from the delegates will assist the Institute's work greatly.

Poland

WATER QUALITY MONITORING SYSTEM

Within the frame of the UNDP/WHO Project Poland 3101 "Protection of river water against pollution", the Water Economics Research Institute, Warsaw, has planned the installation of seven automatic water quality monitoring stations on the upper stretches of the Wisla and Odra rivers. As a result of preliminary work it was decided to build four land fixed stations and four floating stations on barges.
At the beginning the following parameters will be measured: dissolved oxygen, conductivity, ORP, pH, chloride, temperature and water level.
Uptill now two stations have been working contineously: one in Wroclaw and one in Chalupki, both situated at the border between Poland and Czechoslovakia.

CONGRESSES AND SYMPOSIA (See also Newsletter no. 2, February 1971)

Environmental Pollution Control Exhibition and the Effluent and Water Treatment Exhibition and Convention. London - England, March 30 - April 2, 1971. Information: Brintex Exhibitions Ltd, 3 Clement's Inn, London W.C.2, England.

Health Congress and Exhibition. Eastbourne - England, April 19-23, 1971. Organized by Royal Society of Health, Eastbourne, England.

18th Congress of the International Association of Limnology. Leningrad - U.S.S.R., August 19-26, 1971. Information: Organizing Committee 18th Limnology Congress, Laboratory of Limnology, Leningrad 46, U.S.S.R.

Symposium on physics and technology of soil water. Rehovat - Israel, August 29 - September 4, 1971. Information: Organizing Committee, P.O. Box 15, Rehovat, Israel.

Symposium on technics of pumps. Durham - England, September 22-24, 1971. Information: The Institution of the Mechanical Engineers, 1 Birdcage Walk, Westminster, London S.W.1, England.

Seventh Annual American Water Resources Conference. Washington D.C. - U.S.A. Statler Hilton Hotel, October 25-28, 1971. Information: Dr. F.E. Mc Junkin, Dep. of Environmental Sciences and Engineering, University of North Carolina, Chapel Hill, N. Carolina 27514, U.S.A.

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U.S.A.

EROSION TYPE CHEMICAL FEEDER

A specimen of this type was shown to us recently. It works by erosion action of water passing over the chemicals in tablet form. The tablet must have uniform density. The great advantages claimed are ease of operation and maintenance, uniformity of dose and no clogging as no orifices are used. The quantity of chemical to be fed is adjustable and feeding starts and stops with the pumping. Low power source is necessary. No test results of actual use in remote conditions are available.

PHOSPHATE DETERGENTS BANNED IN CHICAGO

Chicago is the first city in the U.S.A. to ban the sale of detergents containing phosphates. Effective June 30, 1972, no detergents containing any phosphates may be sold within the City for any purpose. Less restrictive controls will apply during the interim period.

FEDERAL WATER QUALITY ADMINISTRATION AWARDS NATIONAL WATER WELL ASSOCIATION MAJOR GRANT TO ESTABLISH THE FIRST NATIONAL GROUND WATER QUALITY SYMPOSIUM

Scheduled for Denver, Colorado, August 25-27, 1971, this symposium will be dedicated to the late C.E. Jacob who passed away in January 1970 after a life time of outstanding contributions to ground water hydrology. As the nation's only scientific organization addressed solely to subjects of ground water resource development, protection and utilization, the N.W.W.A. feels very strongly that the time has now arrived to bring the scientific community and the nation at large up to date on the existing solutions to ground water pollution. The National Ground Water Quality Symposium will focus attention on workable problem solutions developed from case histories of investigation techniques and applied methods dealing with a variety of ground water quality topics such as those listed below:

- Movement-quality relationships
- Well construction methods
- Well development and rehabilitation
- Waste disposal
- Sampling and other field techniques
- Ground water recharge and reuse
- Data interpretation techniques.

ENVIRONMENTAL ENGINEERING GRADUATE PROGRAMME

The Department of Civil Engineering University of Illinois, Urbana, Illinois, has prepared an environmental engineering graduate programme, which covers instruction and research in water quality management and air resources engineering. Both master's and doctoral candidates may specialize in one of several areas or follow a broader programme of environmental health engineering of air and water resources.

COMMUNITY WATER SUPPLY STUDY

The Public Health Service document "Community Water Supply - Significance and National Findings", dated July 1970 attracted publicity in the U.S.A. when it was released because of its critical findings relative to a large percentage of the community water supply systems surveyed in several places in the U.S.A. and one in Canada. Studies were: quality of water being delivered, status of physical facilities, operators qualifications, status of community programme and status of state inspection and technical assistance programmes.
The study makes several recommendations to state and municipal officials concerned with the responsibility for safe, adequate water supply and evidences a need for research, development and planning to improve current practices and to provide adequate supplies of safe water in the future.
For further information, please contact the Water Resources Research Center, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

SUMMER INSTITUTES - UNIVERSITY OF NEBRASKA

Two one-week Summer Institutes will be presented at the University of Nebraska. The first Institute entitled "Optimal Analysis of Water Resources Systems" will be held from July 18 - 23, 1971. The objective of this Institute will be to provide indepth training in the application of mathematical programming techniques to the analysis, design, operation and

planning of water resources systems. Topics to be discussed include: economic aspects of water resources systems; linear programming; and non-linear programming.
Primary emphasis will be given to application.
The second Institute, entitled "Simulation of Water Resources Systems" will be held from July 25 - 30, 1971. The objective of this Institute will be to provide indepth training in the development and use of simulation models for application to a wide variety of water resources systems. Topics to be discussed include: probability theory; generation of hydrologic data; numerical methods; simulation model structuring and operation; interpretation of output; and digital simulation of groundwater systems.
Primary emphasis will be on application.
The format permits attending either one of the Institutes or both at a package price. For additional information, contact:
Dir. Warren Viessman, Jr., Director, Nebraska Water Resources Research Institute, University of Nebraska, 212 Agricultural Engineering, Lincoln, Nebraska 68503, U.S.A.

TAIWAN

SIMPLE DISINFECTION DEVICE

An experiment on disinfection of water for drinking purposes by High Test Hypochlorite contained in a special carrier has been conducted by the Taiwan Institute of Environmental Sanitation during the past few years. The carrier is a simple device giving limited residual chlorine for two to three weeks and is most suitable for disinfecting dug wells and small ponds. HTD carrier is a porous dialyzer which is made to have a certain speed of dialysis so that the chlorine solution content which passes into the water through the carrier wall is limited.

JAPAN

WATER SUPPLY SURVEYING TEAM TO THAILAND

The Government of Japan have sent a water supply surveying team for 1 month to Thailand to make a feasibility study for water supplies of Chingmai and Korat with a population of 100,000 and 73,000 respectively.
The project is performed under the auspices of the Goverment of Japan based on a postulation of the Thai Government.
Professor Ishibashi of the Department of City Planning and Sanitary Engineering of the University of Tokyo, led the team of three members of this mission undertaken at the request of the Thai Government.

INDIA

HOW GOOD ARE OUR EXISTING WATER TREATMENT PLANTS?

To answer this question the Central Public Health Engineering Research Institute at Nagpur, India, undertook a survey of 10 water treatment plants in India. The results were very interesting although the investigations pointed out that much work will have to be done before arriving at a reliable and flexible operation for water plants.
In many treatment plants alum and chlorine dosing equipments were out of order. No plant had the capacity to switch over to breakpoint or super-chlorination under emergency conditions. Operational control of the filters was poor. Altough in many cases the filtrate quality was sufficient in respect to turbidity, no bacteriologically safe water was produced not even after chlorination.
The survey was very instructive and the initiative of this may certainly serve as an example for institutions in other countries.

PUBLICATIONS AVAILABLE

From Central Public Health Engineering Research Institute, Nagpur, we received the following publications, which are available on request at IRC.
"Rural Sanitation", research carried out by CPHERI and reported by Prof. S.J. Arceivala, with research results and simple treatment units in the field of Community Water Supply and Sewerage.
"Disinfection for small community water supplies", a brochure based on studies carried out under the project of the same name.

TRAINING COURSES BY CENTRAL PUBLIC HEALTH ENGINEERING RESEARCH INSTITUTE

Within the training activities, following group training courses in Environmental Engineering will be offered each year by the Central Public Health Engineering Research Institute, Nagpur-3, India:

1. Water and waste water analysis (8 weeks)
2. Corrosion control in water and waste water engineering (4 days)
3. Plastic plumbing (2 days)
4. Sewage treatment plant operators (2 weeks)
5. Process design in waste treatment (4 weeks)
6. Air pollution control (2 weeks)
7. Sewage farming (3 days)
8. City refuse disposal (3 days)
9. Structural engineering for public health engineers (2 weeks)

Application forms, details of syllabus and any other information desired can be obtained by writing to the Director, Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-3, India.

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newsletter

Nr. 6 - May 1971

Great Britain

USE OF ANAEROBIC LACTOBACILLI IN WATER EXAMINATION

The Civil Engineering Department, University of Newcastle upon Tyne, is interested in the development of alternative tests for faecal contamination of drinking water, especially for use in tropical climates. A research programme, which is being supported by a WHO Research Grant, is currently investigating the possibilities of using anaerobic lactobacilli as indicators of faecal pollution. The programme is attempting to devise a standard test for the Lactobacilli and to use this test to examine the types and distribution of the bacteria in polluted and unpolluted situations. Comparative tests are being made on the samples for Coliforms, E.coli and Faecal Streptococci. In June and July a similar survey will be carried out in Kenya with the collaboration of the Civil Engineering Department of Nairobi University.

Israel

QUALITY STANDARDS AND CONSUMPTION PATTERNS OF DRINKING WATER

The Israel Ministry of Health has recently established a Committee to draft new standards for drinking water quality. Professor Hillel I. Shuval, Director of the Environmental Health Laboratory of the Hebrew University Hadassah Medical School, is Chairman of the Sub-committee on chemical standards. The Committee is currently studying the question, if in water standards the differences between water consumption patterns in hot arid areas, and temperature coastal and mountain areas should be taken into consideration. Until now drinking water standards have acknowledged this feature only in the case of fluorides. The Israeli Committee now considers applying this criterion also to other standards.

Norway

NOR-WATER

During the last months a new export product has been launched in Norway: drinking water in one-liter cartons. The Norwegian Institute for Water Research is engaged in analysing this water.

Denmark

COURSE IN COASTAL POLLUTION PREVENTION

A WHO Course on Coastal Pollution Prevention, including lectures on water-borne diseases, pathogens transmitted by the water route and indicators, is scheduled to take place in Copenhagen and Aarhus from July 18th to August 14th, 1971.

India

SYNTHETIC MEDIUM FOR BACTERIOLOGICAL ANALYSIS OF WATER

A chemically defined medium containing inorganic ammonium salts as major source of nitrogen was developed in the Central Public Health Engineering Research Institute, Nagpur, and on testing was found to compare favourably with standard MacConkey broth. All 350 samples from different sources, viz. lakes, wells, rivers and water treatment plants were analysed for Coliforms, Faecal Coliforms and E.coli using MacConkey and Synthetic media in presumptive test. In the case of Synthetic medium it was observed that the number of positive tests were consistently more in comparison to the standard MacConkey broth. The work on this project is completed and the data is subject to statistical analysis. The cost of the Synthetic medium is approx. 40% lower than MacConkey broth.

MEMBRANE FILTER

A membrane filter and filter holder from indegeneous raw materials have been developed by the Central Public Health Engineering Research Institute (CPHERI), Nagpur. These membrane filters have been tested already by different laboratories in the country and found comparable to the imported ones. The process of membrane filters preparation is under patenting. It is estimated that a package of 47 mm diameter filter discs manufactured in India would cost Rs 3.00 (each imported filter disc cost nearly Rs 2.50). Manufacturing know-how is being made available for exploitation by CPHERI through the National Research Development Council.

Czechoslovakia

BIOLOGICAL ACTIVITY OF FLUORINE COMPOUNDS

As literature data indicate, biological activity of fluorine could be modified to a great extent due to complex fluorine anions formation in the presence of iron, aluminium, boron, etc. in treated water. First experimental results were gained in the Department of General and Environmental Hygiene, of the Institute of Hygiene and Epidemiology Prague, on biological effect of complex-bound fluorine in rats, fed with increased doses of such compounds. The aim of this research should be the proposal of corresponding technical measures concerning drinking water fluoridation.

WATER QUALITY MONITORING IN DRINKING WATER RESERVOIRS

Devices for the monitoring of raw water quality in drinking water reservoirs are in operation in the automatic field station of the Institute of Hygiene and Epidemiology at the Sedlice Reservoir. Measurements carried out include: the lowest value of turbidity and colour in connection with corresponding automatic operation of inlet valves: polarographic maxima of the oxygen wave as related to colloidal organic matter; the depth of the compensation point of the lower boundary of the trophic layer; localization of thermoclines or layers with a specific temperature range; wave-heights and water level shifts. Raw water for the devices is delivered through a pump moving discontinuously up and down in preselected time and depth intervals.

HUMIC SUBSTANCES IN DRINKING WATER

A maximum allowable concentration of 2.5 mg/l humic substances in drinking water has been suggested for the new edition of Czechoslovak drinking water standards, based on results gained in the Institute of Hygiene and Epidemiology, Prague, CSSR. The above given value just fulfills the corresponding 20 mg Pt/l drinking water standard for colour. Being by about two orders smaller than the organisms, the suggested value of the m.a.c. secures the harmlessness of the use of drinking water containing humic substances. More data on this topic can be found in Arch. Hydrobiol. 65, 4, 515-522.1969.

PUBLICATIONS

From the Pan-American Health Organization we received the following publications in Spanish:
1. Manual of Administration and Management of Water and Sewerage Services.
2. Manual of Billing and Collection for Water and Sewerage Services.
3. Manual of Programming and Control of Sanitary Engineering Projects.
4. Community Water Supply and Sewage Disposal Programs in Latin America.
5. Manual of Operation and Maintenance of Installation and Equipment in an Aqueduct.

Report no. 4 is also available in English.

In the organ of the Centre Belge d'Etude et de Documentation des Eaux, la Tribune du CEBEDEAU of January 1971 following publications appeared: "Action de l'ozone sur le chlore, le bioxyde de chlore et le chlorite contenus dans les eaux traitées" and "Nouveautés en matière de filtration (expérimentation de divers matériaux filtrants sable, anthracite, grenat etc.; relation entre les formules expérimentales et les études mathématiques)".

The World Health Organization, Geneva, published the report of C.P. Straub, Ph.D., Director of the Environmental Health Research and Training Center, University of Minnesota, Minneapolis, Minn., U.S.A.: "Public Health implications of radioactive waste releases".

CONGRESSES AND SYMPOSIA (See also Newsletter no. 2 and 4)

American Water Works Association 91st Annual Conference "Action Now". Subjects: improving quality and quantity of public water supplies, and publicity of water utility industry's results. Denver, Colorado, U.S.A. June 13 - 18, 1971. Information: Melvin F. Jacolow, American Water Works Association, 2 Park Avenue, New York, N.Y. 10016, U.S.A.

4th Water Conference. Madrid, Spain, June 14 - 18, 1971. Information: 4th Water Conference, Paseo de San Juan 39, Barcelona, Spain.

2nd Symposium on the protection of water against mineral oils. Rostock, DDR, October 28 - 29, 1971. Information: Fachverbandes Wasser, Clara Zetkin Strasse 115/117, 108-Berlin, DDR.

International Conference on pumped storage development and its environmental effects. Milwaukee Wisconsin, U.S.A., October 4 - 8, 1971. Information: Dr. Gabor M. Karadi, Professor of Civil Engineering, College of Applied Sciences and Engineering, University of Wisconsin-Milwaukee, Milwaukee, Wisconsin 53201, U.S.A. (telephone: (414) 228-4962).

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Nr. 7 - June/July 1971

INDIA

During the International Conference on Research and Development in Community Water Supply, held at Dubrovnik, Yugoslavia in October 1970, a proposal was offered that the Collaborating Institutions should stimulate the development of a national research plan in their respective countries.

It is a pleasure for us to announce that the Central Public Health Engineering Research Institute convened a conference of research workers and experts from the field, at Nagpur, to identify the research and development needs in public health engineering in India. We received a short report giving some highlights of the discussions and recommendations made at the conference. The main objectives in convening this conference were the following:

1. To identify the research and development needs in the field of public health engineering in order to enable development of a realistic and meaningful Research and Development Programme with special reference to:
   a. water impoundment, treatment and distribution;
   b. treatment and disposal of sewage and industrial wastes including water pollution control;
   c. rural sanitation;
   d. microbiology; and
   e. training, information, liaison and extension services.
2. To recommend priorities and perspectives to be kept in view in this decade upto 1980 taking into account the limited resources available in the country and the need to concentrate efforts on projects of immediate importance so as to have a ready impact on the National Water Supply and Sanitation Programme.
3. To recommend ways and means for promoting and co-ordinating research and development effort in the country amongst the various agencies concerned.

About 140 participants belonging to various agencies attended the conference and took an active part in the 3-day deliberations.

Based on the papers prepared by CPHERI Scientists, which formed the background information, exhaustive discussions took place on each topic which was discussed by a separate panel. Some of the final recommendations of the conference concerning the items water treatment, water distribution, microbiology and rural sanitation are given below topic-wise.

WATER TREATMENT

While considering the most urgent problems in water treatment the conference felt that work on the following merited priority:

1. Natural and synthetic coagulant aids should be given priority with a view to reduce alum consumption and also to increase the filtration rates in the existing water treatment plants.
2. In view of the potential use of two-layer filtration, it was strongly felt that a search should be continued for a good quality coals.
3. In order to save a great deal of effort on designing, construction and other related items, the immediate necessity of developing "package" treatment plants, standardization of their designs and prefabricating the same was stressed.
4. Units, cheaply and easily to operate, for iron and manganese removal, especially for small water supplies and townships were recommended.
5. Tablets for disinfection and clarification of turbid waters would be very desirable for use in the monsoon season in rural areas and for camps.
6. Reverse osmosis technique which is a useful tool to tackle the brackish water problem in vast areas of the country, received a priority rating.
7. A need was felt for more surveys on the performance of the existing municipal water treatment plants so as to better understand the operational failures and also develop correlation between raw water quality and plant performance.

WATER DISTRIBUTION

1. To enable the municipalities to design their water distribution systems most economically, a need for setting up an electric pipeline net-work analyser at a central place was considered essential.
2. More data was needed to enable realistic estimates for designs for domestic and industrial demand as well as the demand for fire fighting facilities.
3. A Manual on use of plastic pipes in water supply and drainage, which was under preparation by CPHERI in consultation with Indian Standards Institution, should be brought out so as to guide the field engineers properly.

4. Control and prevention of biological growths in distribution pipes was another study considered useful together with cost estimates for such control.

MICROBIOLOGY

Improving training facilities for sanitary microbiologists (or environmental microbiologists) at all levels is an urgent need. The Universities which are now providing training in microbiology would do well to give proper emphasis to sanitary microbiology and include an additional or operational paper on this subject in the course. For the field personnel a short training course on microbiological aspects of water and waste water analysis was recommended.

RURAL SANITATION

Rural water supply and sanitation is an important problem for India where only approx. 10% of the population is yet served with piped water supply. The problem is complicated by the need for extreme simplicity of the schemes, the need for funds and the lack of motivation among the rural population for either maintaining the schemes properly or paying for them. Several agencies are actively engaged in this field. In allocating priorities for further investigations in rural sanitation, the conference suggested the following projects for investigation:

1. Improvements to hand pumps with a view to reducing the repairs and maintenance problems;
2. Suitable strainers for small diameter tube-wells in rural areas;
3. Suitable taps for use on public stand-posts so as to prevent water wastage;
4. Treatment units including domestic filters for water supply from the village water tanks and canals;
5. Design criteria for rural piped water supply;
6. Improvements in differential pressure chlorinators;
7. Water quality and related physiological effects in the case of communities consuming waters which fail to meet drinking water standards;
8. Bactoriological quality studies in piped water schemes for rural areas;
9. Desalination units for small community water supply in brackish water areas;
10. Pre-fabrication and standardization for rural water supply components;
11. Rain water collection system;
12. Latrine design with regard to geometry of pits, their lining and adequate superstructure;
13. Digestion of night soil fro semi-urban and suburban areas.

In this Newsletter it is only possible to give a short summary of this succesful conference. The complete proceedings can be obtained from Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-3, India. We hope that the Collaborating Institutions will be able to initiate a similar effort in their country.

RECTIFICATION

In the item on Humic Substances in Drinking Water (Czechoslovakia) in Newsletter No. 6 (May), part of the third sentence was omitted. This sentence should read: "Being by about two orders smaller than the threshold concentration causing toxic effects in warmblooded organisms, the suggested value of the m.a.c. secures the harmlessness of the use of drinking water containing humic substances".

JAPAN

TRAINING COURSES ON WATER SUPPLY ENGINEERING

From the Faculty of Engineering of the University of Tokyo, we received the information that the Training Course on Water Supply Engineering for Developing Countries 1971, was opened at Tokyo on 21st May, and is attended by thirteen participants from nine countries.
The duration of the course is three months.

U.S.A.

BETTER WATER FOR AMERICANS WEEK

Hundreds of communities throughout the U.S. and Canada will celebrate "Better Water for Americans Week", August 8-14. This yearly event sponsored by the American Water Works Association, which represents the more than 30,000 water utilities in North America, calls public attention to the vital functions they provide every day, and rallies support for improving public water supply to meet the challenges of increasing population, industrialization and pollution.

HYDROLOGIC INFORMATION STORAGE AND RETRIEVAL SYSTEM

A computerized system for storage, retrieval and routine processing of hydrologic data has been developed by Dr. Edward H. Wiser at North Carolina State University with joint support of the Water Resources Research Institute and the N.C. Agricultural Experiment Station. The system is known as HISARS (Hydrologic Information Storage and Retrieval System). For further information, please communicate with Dr. Wiser, Department of Biological and Agricultural Engineering, University of North Carolina, Chapel Hill, North Carolina 27514, U.S.A.

YUGOSLAVIA

SEMINAR ON THE HYGIENIC PROBLEMS OF WATER SUPPLY AND WASTE WATER DISPOSAL IN YUGOSLAVIA

For the above mentioned seminar, held in Split from 19 to 24 April 1971, some 30 reports were submitted, dealing with water supply and waste water management topics, with particular reference to the conditions prevailing in Yugoslavia.

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newsletter

Nr. 8 - August 1971

To the reader of this Newsletter
In order to make our mailing list up to date and to intensify our activities, please pay attention to the enclosed questionnaire. Please return the completed form to IRC, Parkweg 13, The Hague, the Netherlands.

Poland

INTERNATIONAL SYMPOSIUM ON AUTOMATIC WATER QUALITY MONITORING

A symposium on Automatic Water Quality Monitoring organized by WHO, Regional Office for Europe and Water Economics Research Institute, Poland, was held in Cracow from March 29 to April 2, 1971 and was attended by participants from 18 West- and Eastern European countries and the USA and WMO, CMEA and WHO. Subjects handled during the lectures and discussions were: storage and evaluation of data from monitoring systems, studies on location of monitoring stations and water quality monitoring equipment.

Great Britain

ARTIFICIAL GROUND WATER RECHARGE

We received the proceedings of the artificial ground water recharge conference, held at the University of Reading, 21 - 24 September 1970. The Conference was convened by the Water Research Association. The following papers are included in the proceedings:
- Hydrogeological and groundwater aspects of artificial recharge;
- Economic feasibility of artificial recharge;
- The design of artificial recharge schemes;
- The principles and practice of pretreatment for artificial recharge;
- The clogging processes and optimization of basin recharge;
- Methods of sustaining good infiltration results;
- Fundamental variations in the water quality with percolation in infiltration basins;
- Water quality aspects of intermittent infiltration systems using secondary sewage effluent;
- The hydraulics of artificial recharge;
- Borehole recharge: The compatability of recharge water with the aquifer;
- Pilot scale investigations of well recharge using cored samples;
- Practical experiences of well recharge;
- Clogging in recharge wells, causes and cures;
- Groundwater recharge for waste water reclamation and/or storage of supplies: a cost comparison with conventional methods;
- Future prospects of artificial groundwater recharge;
- Artificial groundwater recharge practice in Israel: economic analysis;
- Sanitary significance of coliform bacteria in recharge wells;
- Recharge of carbonaceous saline aquifer of south Florida with treated sanitary waste water;
- Artificial recharge investigations by the water resources board;
- Artificial recharge in Czechoslovakia.

The proceedings are presented in two volumes, price £10.- and available at The Water Research Association, Ferry Lane, Medmenham, Marlow, Buckinghamshire SL7 2HD, England.

DOCUMENTS AVAILABLE FOR DISTRIBUTION TO OUR COLLABORATORS UPON REQUEST

WHO/CWS/71.1 - The control of water-borne epidemics (including cholera and other enteric infections) through the improvement of community water supply.

The paper deals with the reduction of biological health hazards, the maintenance of bacteriological quality and the control of epidemics. One objective of the present paper is to call the attention of those responsible for the operation, maintenance and surveillance of systems of domestic water supply to the points of particular danger, and to action that can be taken, quickly and cheaply, before and during an epidemic to lessen these hazards. A list of references to other relevant WHO publications is given at the end of the paper.
More in detail the following items are discussed:
- Surveillance of water quality;
- Health precautions in urban water supplies;
- Health precautions in rural water supplies.

Czechoslovakia

PREVENTIVE CONTROL MEASURES ON DRINKING WATER PONDS

Positive results have been achieved by the Institute of Hygiene and Epidemiology at Prague concerning the control of raw water quality on some drinking water ponds (i.e. shallow reservoirs, used as fish-ponds formerly), which because of the lack of satisfactory sources for community water supply in some areas of Czechoslovakia, have to be used also for the purpose of water works.
A combination of destratification achieved through compressed air with the possibility of active chlorine distribution used if necessary, is able to prevent massive algae development in the whole volume of water, reducing at the same time costs of the treatment and occurence of bad taste and odour of raw water. Detailed information can be obtained from Dr. M. Stepanek, C.Sc., Institute of Hygiene and Epidemiology, Srobárova 48, Prague 10, CSSR.

USA

METALS IN STREAMS

News from AWWA, Washington report, April 1971.
The United States Geological Survey has just completed a nationwide reconnaissance of metals in streams. The report summarizes the results of this study of selected metals, particularly in sources of water for metropolitan areas.
Hydrologists of the Geological Survey, working in cooperation with the Bureau of Sport Fisheries and Wildlife, analyzed more than 720 water samples from urban and rural locations in all 50 states, Puerto Rico, and the District of Columbia for arsenic, cadmium, chromium, cobalt, lead, zinc and mercury. The representative raw water samples were collected last autumn during low streamflows characteristic of dry weather. According to the report, such flows accentuate all materials dissolved in the water, including these metals.
The study found, that small amounts of the seven metals are widely distributed in the streams and lakes of the United States. Although much of the sampling was concentrated in and around the nation's urban centres, where streams might be expected to receive metals from industrial and municipal waste treatment systems, there appears to be no widespread occurrence of these metals in streams and lakes in amounts exceeding current U.S. Public Health Service drinking water standards. Only a few samples of the more than 720 collected contained heavy metal concentrations in excess of Public Health Service standards for drinking water; 4 per cent of the water samples contained cadmium concentrations over 10 micrograms per liter, and 2 per cent of the samples contained arsenic over 50 micrograms per liter. A few samples contained lead and mercury concentrations in excess of 50 micrograms per liter and 5 micrograms per liter respectively. (One microgram per liter is equal to one part per billion, or one pound of metal in one billion pounds of water).
The report, "Reconnaissance of Selected Minor Elements in Surface Waters of the United States", by W.H. Durum, J.D. Hem and S.G. Heidel, is published as Geological Survey Circular 643. Copies are available free upon request from the Director, U.S. Geological Survey, Washington DC 20242.

CONGRESSES AND SYMPOSIA

International Congress of the International Association of Hydrogeologist, Tokyo, Japan, August 17 - 26, 1971. Information: International Association of Hydrogeologists, 74, Rue de la Fédération, 75-Paris 15e, France.

National Ground Water Quality Symposium (sponsored by the Environmental Protection Agency and National Water Well Association), Denver, Colorado, USA, August 25 - 27, 1971. Information: Dr. Jay H. Lehr, NWWA, 88 E. Broad Street, Columbus, Ohio 43215, USA.

44th Congress of the Water Pollution Control Federation, San Francisco, California, USA, October 3 - 8, 1971. Information: Water Pollution Control Federation, Room N. 302, 4435 Wisconsin Av. N.W., Washington DC 20016, USA.

8th Exhibition on equipment for prevention of soil, water and air pollution, Utrecht, Netherlands, October 14 - 21, 1971. Information: Jaarbeurs, Beursplein, Utrecht, Netherlands.

Symposium on Salinity and Water, sponsored by the Australian Academy of Science, Canberra, Australia, November 2 - 4, 1971. Information: Secretary, Australian Academy of Science, Gordon Street, Acton, ACT 2601, Australia.

6th International Conference on Water Pollution Research, Jerusalem, Israel, June 18 - 24, 1972. Information: Israel Host Committee, POB 16271, Tel-Aviv, Israel.

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newsletter

No. 9 - September 1971

News from I.R.C.

COMMUNITY WATER SUPPLY RESEARCH 1971

Research co-ordination is one of the tasks of the W.H.O. International Reference Centre for Community Water Supply.
Recently I.R.C. collected and compiled the research items of the Collaborating Institutions. This compilation is now issued as Bulletin No. 1, entitled "Community Water Supply Research 1971". The aim of this paper is to enable research workers in the field of Community Water Supply to get into contact with his colleagues about problems of mutual interest.
With regard to research projects, a general classification of community water supply topics has been elaborated. All research projects have been classified according to this classification. Next to the research topic the name of the project leader is mentioned and an indication is made if papers or reports are available for dissemination. I.R.C. hopes that this information will result into an intensive exchange of research findings and programs.
At I.R.C., Bulletin No. 1 is available for distribution upon request.

QUALITY OF DRINKING WATER AND CARDIOVASCULAR DISEASES

It is generally known, that the mortality from cardiovascular diseases is increasing and that these diseases have become the most common cause of premature death, particularly in the developed countries. In 1959 a unit responsible for work in cardiovascular diseases was set up at W.H.O. Head quarters.
Investigations will be carried out on influence of environmental factors on cardiovascular function and the relationship between mineral content in drinking water and incidence of cardiovascular diseases. The I.R.C. requests data and information about any research in this problem. The information should be forwarded to the W.H.O. International Reference Centre for Community Water Supply, Parkweg 13, The Hague, the Netherlands or directly to The Cardiovascular Diseases Unit, W.H.O., Geneva, Switzerland.

Netherlands

MASTERPLAN DAKAR (SENEGAL)

The Materplanning Project for Dakar consists of a series of pre-investment studies, which cover engineering, groundwater, management, financial and economic problems. With the exception of the groundwater survey, the project is assigned to a Dutch Consulting firm.
The Engineering studies consist of:

a) establishment of a Masterplan for water supply, sewerage and drainage in Dakar and surrounding areas over the period from 1968 until the end of this century;
b) preparation of preliminary engineering and feasibility studies for those components of the Masterplan for which investment in the coming 10 years is contemplated.

The Dutch Government Institute for Drinking Water Supply is entrusted with the task to study the technical aspects of fresh water production, transmission and storage, the chemical and bacteriological quality, to review the groundwater survey and to frame the legislation.

Israel

PUBLIC HEALTH ASPECTS OF WATER-BORNE ENTERIC VIRUSES

The Environmental Health Laboratory, Hebrew University, Hadassah Medical School, Jerusalem, has recently completed a two-year study on the public health aspects of waterborne enteric viruses. A one-hundred and twenty page monograph, reporting the findings of this study has been prepared and includes chapters dealing with:

- Methods of Detection of Enteric Viruses in the Water Environment
- Studies on the Detection and Control of Enteroviruses in the Water Environment
- The Dispersion and Disappearance of Enteroviruses and Bacterial Pollution Indicator Organisms in the Jordan River Lake Kinneret Watershed
- Marine Antiviral Activity

U.S.A.

STABILITY OF WATER IN DISTRIBUTION SYSTEMS

In the Water Quality Monitoring Project the National Sanitation Foundation at Ann Arbor, Michigan has developed an electrochemical method for characterizing the stability of water in distribution systems, using a rotating ring-disc electrode. With this short term method, calcium carbonate saturation equilibrium need not be established before evaluating data.

Great Britain

EFFICIENCY OF OZONE FOR VIRUS DISINFECTION

We received the following announcement from the Civil Engineering Department, University of Newcastle upon Tyne:
"Although ozone has been used for many years in water disinfection, particularly in France, there is very little experimental data published on the factors which affect the efficiency of the process. The Science Research Council is supporting a research project in this department which aims to establish the effect of a wide range of environmental conditions on the rate reaction constants of ozone disinfection. Inactivation rates of purified bacteriophage and several strains of enteroviruses are under investigation and will be compared with chlorination data".

FREEZE DESALINATION AT IPSWICH, U.K.

A 1 million gallon per day experimental freeze desalination plant is to be constructed on the east coast of England near the town of Ipswich. The project is to be financed through the Water Resources Board with the United Kingdom Atomic Energy Authority acting as main agent. The design and construction is to be undertaken by Simon Engineering Ltd., who have developed the process in conjunction with the UKAEA.
After commissioning, which is scheduled for mid 1973, the plant will be operated experimentally for a period of two years to serve as a demonstration of the process and to provide design and cost data. Feed water is to be drawn from the estuary of the River Deben with a total dissolved solids of 35,000 ppm. This feed will be pumped to the Bucklesham Treatment Works where the plant is to be located. Product water, after storage for potability tests, can be passed through the conventional water treatment plant and put into the supply system for the Ipswich Corporation Water Undertaking. This is an area of water shortage and the desalted water could make a useful contribution to the resources of that Undertaking.

Czechoslovakia

TOXIC WATER BLOOMS

An investigation carried out by the former Institute of Hygiene, Prague, revealed the existence of toxic water blooms on some ponds and reservoirs of Czechoslovakia. The blooms or their products could irritate human skin, produce conjunctivitis or even dermatitis arteficialis, on exposition during contact recreation or in testoplast experiments. Anabaena flos aquae, Aphanizomenon flos aquae, Coelosphaerium sp., Microcystis aeruginosa, Nostoc sp., Oscillatoria sp., and Haematococcus droebakensis were the species causing toxic effects on man or test animals. Due to its extensive occurence during vegetation period on many ponds and reservoirs water blooms can be potentially dangerous regarding its harmful effects. Those wanting more detailed information are referred to a paper in Sci. Pap. Inst. Chem. Technol., Prague 1963, Technol. Water 7, 2, 175 - 263: Water blooms in the CSSR, by M. Stepánek et al. Reprints in English are available at the following address: Dr. J. Chalupa, IHE - IGEH, Srobárova 48, Prague 10, CSSR.

India

BITUMINOUS COAL, A SUBSTITUTE FILTER MEDIA FOR ANTHRACITE

The Central Public Health Engineering Research Institute, with the help of other organizations in the coal field, made an intensive search to locate sources of anthracite in the country so as to promote adoption of two-layer filtration in view of its potential application in many of the existing overloaded water treatment plants. No anthracite source, however, has so far been located in the country and hence the suitability of indigenous high grade bituminous coals as subsitute media was investigated. The results of the suitability tests indicate that indigenous good quality bituminous coals, though possessing a comparatively lower density and hardness than anthracite would serve sufficiently well as a substitute for anthracite media.

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the hague, the netherlands
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newsletter

No. 10 - October 1971

News from I.R.C.

PLASTIC PIPE IN DRINKING WATER DISTRIBUTION PRACTICE

Within the activity in research co-ordination, the W.H.O. International Reference Centre for Community Water Supply has taken up the study on plastic water pipe. The aim of this study is to gain full information on the present picture of research, production, performance, standards, specifications and test methods of plastic pressure pipe; to collect experience on design, installation, operation and maintenance of plastic water mains; and to produce guidelines on installation and maintenance of plastic pipe in drinking water distribution practice.
To introduce the subject and to initiate the data collection the technical paper entitled "Plastic Pipe in Drinking Water Distribution Practice" was issued by the I.R.C. A bibliography has been added to the paper, in order to serve as a guide to literature on application and development of plastic water pipe during the period 1951 - 1970. The paper is available for distribution to institutions and individuals upon request.
The I.R.C. requests information about specifications, test methods, performance of plastic pipe and laying, tapping and maintenance of plastic pipe mains, use of plastic pipe for river crossings, from any water utility, institution or individual who is or was involved in problems of plastic water pipe.
The Centre would be most grateful if the information could be communicated to the W.H.O. International Reference Centre for Community Water Supply, Parkweg 13, The Hague, the Netherlands.

Israel

DETECTION OF OZONE

A new method for the detection of ozone used as a disinfectant in water supplies has been developed by the Environmental Health Laboratory, Hebrew University, Hadassah Medical School, Jerusalem, in connection with its studies on the use of ozone for the inactivation of enteroviruses. The new method is based on the spectrophotometric determination, uses a small water sample of 5 ml and has shown to be stable, accurate and highly reproducible. The method has been submitted for publication and when reprints are available, copies will be sent to interested parties.

U.S.A.

NATIONAL SANITATION FOUNDATION WATER QUALITY MONITORING PROJECT

Progress during 2 years of research on the NSF Water Quality Monitoring Project is described in a comprehensive report prepared for the Division of Water Hygiene, EPA. This report includes evaluation of the following analytical techniques with respect to applicability for continuous measurement of potable water quality:

1. ion selective electrodes for hardness, fluoride, chloride, and nitrate;
2. anodic stripping voltammetry (ASV) for heavy metals;
3. UV measurement of gross organics;
4. amperometric analysis of residual chlorine;
5. turbidity by light scatter nephelometry (a new technique being developed for monitoring stability with a rotating ring disc electrode is also discussed in the report).

A paper, "Electrochemical Characterization of Fluorides in Drinking Waters" has been submitted for publication in a professional journal. Pre-publication copies are available from Dr. Nina I. McClelland, Program Director, National Sanitation Foundation, P.O. Box 1468, Ann Arbor, Michigan 48106, U.S.A.

ENGINEERING MEASURES FOR CONTROL OF SCHISTOSOMIASIS

The Agency for International Development (Department of State, Washington D.C. 20523) recently commissioned Professor Eugene McJunkin of the University of North Carolina to make a "state-of-the-art" study on the subject of Engineering Measures for Control of Schistosomiasis. His study is designed to:

1. provide background to national policy makers, senior economic and agricultural planners, public health officials, irrigation personnel etc.;
2. enable epidemiologists, malacologists, physicians and others to understand the role, or potential role, other than dispensers of molluscides, of engineers in the control of Schistosomiasis, and
3. enable engineers to work effectively with these and other professionals in the design and operation of control programs.

From the table of contents we mention the following main items:

I. Background (Life Cycle of the Schistosomes, clinical Manifestations in Man, Distribution and Prevalence, Economic Impact, Relation of Schistosomiasis to Irrigation, "Ecological Horror Stories").

II. Ecology of intermediate snail hosts (Physical Factors, Chemical Factors, Biological Factors, Pollution, Seasonal and Climatic Factors).

III. Control of Schistosomiasis (Therapeutic Treatment of Human Victims, Prevention of Eggs Reaching Water, Destruction of Eggs and Miracidia, Destruction of Intermediate Snail Host, Destruction of Cercariae, Prevention of Cercarial Infection of Man).

IV. Engineering measures for control (Disruption of Life Cycle, Creation of Unfavorable Environment for Intermediate Snail Hosts, Distribution and Drainage Systems, Storage Reservoirs, Environmental Sanitation, Public Water Supply, Agricultural Practices, Miscellaneous Control Measures, Relation of Engineering to Chemical Control).

V. Recommendations (Better use of Existing knowledge, Research, Role of Environmental Control Measures).

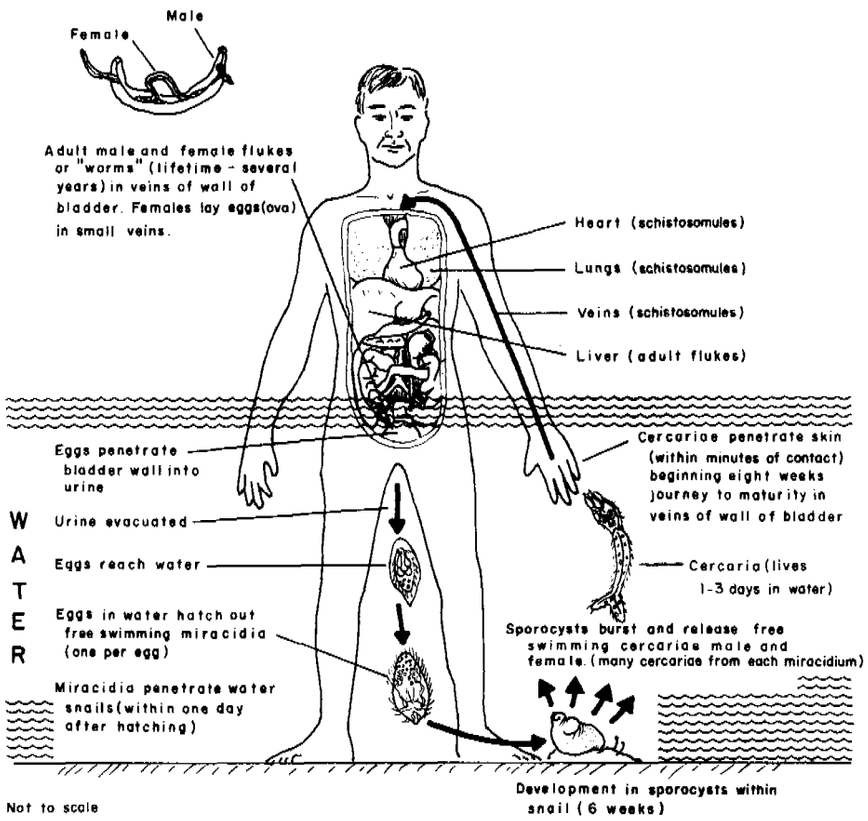

Figure No. 1. LIFE CYCLE OF SCHISTOSOMA HAEMATOBIUM.

CONGRESSES AND SYMPOSIA

First course in water pollution control, organized by the American University of Beirut, Faculty of Engineering and Architecture, 22 November - 4 December 1971.
Information: The Organizing Committee, Office of the Dean, Faculty of Engineering and Architecture, American University of Beirut, Beirut, Lebanon.

WHO's EMRO is holding a seminar on "Sanitation Problems due to Rapid Urbanization" in collaboration with the University of Engineering and Technology at Lahore, W. Pakistan, 7 - 14 October 1971.
Information: Dr. M. Islam Sheikh, Professor of Public Health Engineering, University of Engineering and Technology, Lahore, West Pakistan.

~~Ninth International Water Supply Congress and Exhibition, New York Hilton, New York~~, U.S.A., September 11 - 15, 1972.
Information: Secretary General, I.W.S.A., 34 Park Street, London W.1, Great Britain.

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No. 11 - November 1971

News from I.R.C.

PUBLICATIONS

Publications, unpublished reports, reviews and proceedings are regularly received at I.R.C. from several institutions all over the world, among which the Collaborating Institutions of the I.R.C. and a great number of institutions and organizations of the U.S.A. ~~Lists stating the titles of those publications with the names of~~ the issuing agencies, are monthly published and are available upon request at the I.R.C.

India

ENUMERATION OF VIRUSES FROM SEWAGE

The Central Public Health Engineering Research Institute in Nagpur, gives a modification of the membrane filter method described by Wallis and Melnick (1967, Bulletin World Health Organization 36: p. 219-225).
It has been reported that waste water contains membrane coating compounds (M.C.C.), which interfere with virus adsorption on millipore membranes. To remove the M.C.C. the samples were passed through an ion exchange resin.
The new procedure eliminates the need for passing the sample through resins by the mere adjustment of pH to 3,0 and centrifugation.
In brief, the method consists of the following steps:
The sample is homogenised for four minutes in a waring blender and centrifuged at 3,000 RPM for 30 minutes. The sample is adjusted to pH of 3,0 and is again centrifuged at 10,000 RPM for 30 minutes. Magnesium chloride is added to a concentration of 1,200 mg of Mg^{++}/1 of sample. It is filtered under suction through a 0.45 micron, 47 mm diameter millipore membrane. Virus trapped on the membrane is eluted with 5 ml of 3 per cent beef-extract of pH 8.0 and plagued on Rhesus Monkey kidney cell cultures in glass bottles.
This method gives hundred per cent recovery of viruses as found in all the experiments conducted with autoclaved sewage to which viruses were added, and was also used in field trials for examining effluents.

Yugoslavia

CHLORINATOR FOR CONSTANT WATER CHLORINATION IN SUNK WELLS AND OTHER LOCAL WATER OBJECTS

From Yugoslavia we received the message that a simple dosing device for water disinfection with a chlorine solution has been developed by Metalac, Beograd, Suboticka broj 23.
The brochure concerned states that the device delivers an adequate chlorine dose to the water of sunk wells in correspondence with the quantity of the water consumption. The dosing principle is based on variations in pressure induced by differences in the water level in the well during the water consumption. The device can disinfect small wells automatically for a period of several months. Other chemicals as well, can be dosed automatically by this device.

Czechoslovakia

WATER BLOOM CONTROL IN CZECHOSLOVAKIA

Extremely warm weather during summer of 1971 resulted in massive water bloom development on many drinking water reservoirs or ponds of Czechoslovakia, originating at the same time, serious problems in the water works. As usual, on many instances appropriate measures for water bloom control had to be used. These consisted mainly in the application of the algicide formula CA 350. This formula, a combination of copper and silver compounds, shows not only an instant effect on blue-green algae, but due to the presence of silver rapid decomposition of organic matter followed usually with DO depletion can be avoided. Each application of an algicide in Czechoslovakia is guided by a staff member of the Water Hygiene Section, Institute of Hygiene and Epidemiology, Prague, where also further informations may be obtained on this topic.

U.S.A.

A.W.W.A. POLICY STATEMENT CONCERNING THE USE OF RECLAIMED WASTE WATERS AS A PUBLIC WATER SUPPLY SOURCE

The American Water Works Association recognizes that properly treated waste waters constitute an increasingly important element of the total available water resources in many parts of the North American continent as well as elsewhere in the world. Historically, waste waters have been reused after discharge of the effluents to streams and into the ground. This practice has provided dilution, separation in time and space, and has allowed natural treatment phenomena to operate before reuse.

In contrast to such indirect reuse, planned direct reuse increasingly is being made of reclaimed waters for wide varieties of beneficial use such as industrial cooling, certain industrial processes, irrigation of specific crops and recreational areas. Moreover, there is increasing use of reclaimed waters for planned ground water recharge.

The Association believes that the full potential of reclaimed water as a resource should be exploited as rapidly as scientific knowledge and technology will allow, to the maximum degree consistent with the over-riding imperative of full protection of the health of the public and the assurance of wholesome and potable water supplied for domestic use. The Association encourages an increase in the use of reclaimed waste waters for beneficial purposes, such as industrial cooling and processing, irrigation of crops, recreation and within the limits of historical practice, ground water recharge. Further, the Association commends efforts that are being made to upgrade waste water treatment and to improve quality before discharge into sources of public water supplies.

The Association is of the opinion, however, that current scientific knowledge and technology in the field of waste water treatment are not sufficiently advanced to permit direct use of treated waste waters as a source of public water supply and it notes with concern current proposals to significantly increase both indirect and direct use of treated waste waters for such purposes. It urges, therefore, that immediate steps be taken, through intensive research and development, by the A.W.W.A. Research Foundation and the Water Hygiene Division of the Office of Water Programs in the Environmental Protection Agency to advance technological capability to reclaim waste waters for all beneficials uses. Such research and development is considered to be of greater national need than that now being directed to desalinization. It should:

1. Identify the full range of contaminants possibly present in treated waste waters with might affect the safety of public health, the palatability of the water and the range of concentrations.
2. Determine the degree to which these contaminants are removed by various types and levels of treatment.
3. Determine the long-range physiological effects of continued use of reclaimed waste water, with various levels of treatment, as the partial or sole source of drinking water.
4. Define the parameters, testing procedures, analytical methodology, allowable limits, and monitoring systems which should be employed with respect to the use of reclaimed waste waters for public water supply purposes.
5. Develop greater capability and reliability of treatment processes and equipment to produce reclaimed water of reasonably uniform quality in view of the extreme variability in the characteristics of untreated waste waters.
6. Improve the capabilities of operational personnel.

The Association believes that the use of reclaimed waste waters for public water supply purposes should be deferred until research and development demonstrate that such use will not be detrimental to the health of the public and will not adversely affect the wholesomeness and potability of water supplied for domestic use.

Detailed information on this subject can be obtained from the American Water Works Association, 2 Park Avenue, New York, N.Y. 10016.

REPORT ON SHARING FINANCIAL RESPONSIBILITY OF WATER DEVELOPMENT

An analysis of State and Local Capability to Share Financial Responsibility of Water Development with the Federal Government, a study performed for the U.S. Water Resources Council by Mr. Daniel H. Hoggan, Assistant Director, Utah Water Research Laboratory, has been published. The purpose of the study and report is to determine general State and local capability to raise finances, enter into repayment contracts, provide services or in appropriate ways share the cost of water development with the Federal Government.

The report contains a general discussion of State and Local capability to raise finances for capital projects and is presented under three major headings:

1. Long term Debt
2. Fiscal capacity and tax effort
3. Expenditures.

Specific problems and issues of water project financing and cost sharing, some of the financial arrangements and associated problems in California and Louisiana are described. Conclusions, drawn through the process of deduction are presented and pertinent selections are made from available literature.

Copies of this report are available in limited numbers as long as present stocks are available at the Water Resources Council, 2120 L Street N.W., Washington D.C. 20037.

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No. 12 - December 1971

News from I.R.C.

CATALOGUE OF GROUP TRAINING COURSES

In order to meet the demands for qualified personnel in the field of community water supply, group training courses are organized by various institutions. Within its activity the I.R.C. has collected data on education and professional training by the Institutions collaborating with I.R.C. The information has been brought together on forms, mentioning the 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 to date and course fees for participation. A catalogue of the courses has now been issued and is available on request at I.R.C. Please ask for Bulletin no. 2: "Training Courses in Community Water Supply 1971".

DUBROVNIK PROCEEDINGS - NOW AVAILABLE

A report of the Proceedings of the International Conference on Research and Development in Community Water Supply, which was held last year in Dubrovnik, Yugoslavia is now available and can be requested from I.R.C. This conference was a sponsored project of the Government of the Federal Socialist Republic of Yugoslavia, The Federal Administration for International Technical Co-operation, The Croatian Institute of Public Health of Yugoslavia and The Government of the United States.

"THE VILLAGE TANK AS A SOURCE OF DRINKING WATER"

Based on the many requests of WHO/CWS/RD/69.1 publication on this subject, we would say that a problem of general interest has been touched. Reason for dissemination of this paper was to bring this topic into discussion, and evoke comments, suggestions, requests for advice, own experience, stories of somewhat different conditions and their specific solutions in your country etc.
By the interchange of ideas, the I.R.C. is trying to come to a compilation of advice and experience, which will be useful to those who have to solve rural water supplied.
All who have practical experience on this subject and especially those who come into contact with above mentioned paper, are requested to send their comments to I.R.C., 13 Parkweg, The Hague, The Netherlands.

COMMUNITY WATER SUPPLY RESEARCH PROJECTS

The Bulletin no. 1 entitled "Community Water Supply Research 1971", issued in June 1971 includes the information on research projects carried out by Institutions officially nominated as Collaborating Institutions.

The intention of the I.R.C. is to collect and disseminate continuously information on community water supply research.
The Centre would be much obliged to have information on research projects from any institution involved in community water supply research. This information will be disseminated continuously through our bulletin.
The Centre is collecting information on forms mentioning the name of the institution, project title, the name of the project leader, remark if papers or reports are available for dissemination, and classification numbers according to the general classification of community water supply topics, given in the bulletin no. 1. Forms are available upon request.

Czechoslovakia

VIRUS REMOVAL DURING COAGULATION

In an investigation of the conditions of the removal of enteroviruses during coagulation in the Institute of Hygiene and Epidemiology in Prague, it was found that with the doses of aluminium sulphate used during usual water treatment (up to 100 mg $Al_2/SO_4/3$ per litre) the amount of viruses could be reduced, but never removed completely.
Increased doses (200 - 500 mg $Al_2/SO_4/3$ per litre) are able to remove viruses from water even heavily loaded with organic matter, as far as it was contaminated with a brain suspension or viruses from a tissue culture. In this instance the maximum removal of viruses from a sample of raw water, contaminated with their purified form, are difficult to be removed, as regards especially very clean waters contaminated in the same way.
On these conditions an addition of 0.01% solution of polyvinylalcohol to the forming flocs of aluminium hydroxide proved to be very effective in the removal of viruses.
A complete removal of viruses even from clean water contaminated with the purified virus was achieved following a reduction of the zeta potential, i.e. on the use of the optimum doses of aluminium sulphate and polyvinylalcohol at a suitable pH value.
A limited number of reprints of reported results (published in German by V. Fraňková, K. Symon, and R. Červenka, 1964) are available on request at the address: R. Červenka, Institute of Hygiene and Epidemiology, Šrobárova 48, Prague 10, Czechoslovakia.

HONG-KONG

FRESH WATER FROM THE SEA

The Director of Water Supplies in Hong Kong has announced the construction of a desalination project, by which the Colony will have one of the largest desalters in the world by 1974 with a capacity of 20 MGD at an estimated construction cost of £13 million.
It was pointed out that because of shortage of further water sheds, the sea should be the future source of fresh water to meet the needs of a modern society.
In the desalting process heated brine is "flashed" through a large number of stages, thus economically using steam, which is generated in oil fired boilers. Operational cost is estimated at £1.44 million per annum.

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No. 13 - January 1972

News from I.R.C.

MEETING OF THE ADVISORY BOARD

The 4th Meeting of I.R.C.'s Advisory Board took place on December 13th in The Hague. The meeting was also attended by Mr. L.A. Orihuela, and Mr. D.V. Subrahmanyam of the W.H.O. Community Water Supply and Sanitation Unit. It was a consensus of the Board that during 1971 a closer cooperation between I.R.C. and the Collaborating Institutions has been established. The media of exchange of information, e.g. the newsletter and I.R.C.'s bulletins, came into operation and met a want.
Personal contacts stimulated the activities of I.R.C. The cooperation between I.R.C. and the International Water Supply Association has been strengthened. For 1972 steps will be undertaken to increase I.R.C.'s staff and budget.

W. Germany

WATER TREATMENT BY ELECTROPHORESIS

The possibility of separating dispersed and colloidal impurities from water by electrophoresis was studied in the Institute for Physics and Chemistry of Boundary areas of the Fraunhof Society. Calculation as well as experiments with a small laboratory plant, indicate that continuous separation requiring less than 1 kwh electrical energy per cu.meter of water is feasible.

India

TECHNICAL ASSISTANCE BY C-PHERI

In investigating the possibility of assistance to Tanzania (East Africa) in treating drinking water containing excessive concentrations of fluorides, the Government of India assigned the Central Public Health Engineering Research Institute at Nagpur, India, to study the problem.
A proposal for a pilot unit was suggested for Ol Joro / Burka Estate in which 400 cu.m/day spring water with 7 mg/l fluoride concentration will be treated to an acceptable 0.6 - 0.8 mg/l.
The process consists of passing the water over a synthetic carbonaceous sulphonated material using alum as a regenerant (cf. Defluoridation, a publication of the same institute).

News from W.H.O.

REORGANIZATION OF DIVISION OF ENVIRONMENTAL HEALTH, W.H.O.

With effect from 1 October 1971, the units of Community Water Supply (CWS), Sanitation Services and Housing (SSH) and Wastes Disposal (WD) were disestablished. Two new units were created: Community Water Supply and Sanitation (CWSS) with Mr. L.A. Orihuela as Chief, and Development of Institutions and Services (DIS) with Mr. J.N Lanoix as Chief. The functions of the Community Water Supply and Sanitation Unit will include advising on community water supply and wastes disposal, on community sanitation including the hygiene of housing and food sanitation, and on engineering measures for protection from disease vectors.
The functions of the Development of Institutions and Services Unit will include advising on the development of the services and institutions required for the effective planning and management of environmental health programs and of the manpower required for such programs.

U.S.A.

NEW NEWSLETTER

The Environmental Engineering Department of the University of Florida has announced the publication of a new newsletter, "ECOTEK", which will appear twice a year.

COAGULATION COSTS DOWN?

The EPA - A.W.W.A. is sponsoring a two year project to demonstrate the use of magnesium carbonate and lime as a coagulant in treating surface water, which may well revolutionize the economics of water and waste water treatment.

Co-directors are Dr. A.P. Black, Research Professor Emeritus of Chemistry and Environmental Engineering of the University of Florida and Dr. Clifford Thompson.

COMMUNICATION OF WATER-RELATING RESEARCH DATA

The Water Resources Scientific Information Center established in Washington D.C. by the Secretary of the Interior has been designated by the Federal Council for Science and Technology to serve the water resources community by improving the communications of water-relating research results. To provide WRSIC with input, 14 selected organizations with active water resources research programs are supported as Centers of Competence responsible for selecting, abstracting and indexing from the current and earlier pertinent literature in specified subject areas. Input from these Centers, and from the 51 Water Resources Research Institutes administered under the Water Resources Research Act of 1964, becomes the information base from which "Selected Water Resources Abstracts", a semi-monthly journal, and other information services is derived. Grantees and contractors of the Office of Water Resources Research and other Federal water resources agencies with which the Center has agreements also contribute information. The services provided include bibliographies, specialized indexes, literature searches and state-of-the-art reviews.

Congresses and Symposia

Second International Exhibition Man and Water 1972.
Le Bourget Airport, Paris, France, April 11 - 15, 1972.
Information: L'homme et l'eau, 8 Rue de la Michodière, Paris 2e, France.

1st International Exhibition of Techniques and Equipment against Pollution, Padua, Italy, 3 - 7 May 1972.
Information: SEP-Pollution, Fiera Internazionale di Padova, Via N. Tommaseo 59, I-35100 Padova, Italy.

International Symposium on Modelling Techniques in Water Resources Systems, Ottawa, Canada, 9 - 12 May 1972.
Information: Dr. A.K. Biswas, Chairman, Organizing Committee, Department of Fisheries and Forestry, Ottawa, Canada.

XXVth International Congress CEBEDEAU on Water, Air, Corrosion, Liege, Belgium, May 16 - 19, 1972.
Information: CEBEDEAU, 2 Rue Armand Stévart, B-4000 Liege, Belgium.

8th Congress on Irrigation and Drainage, Varna, Bulgaria, May 1972 (beginning of 3rd week)
Information: Central Office of the International Commission on Irrigation and Drainage, 48 Nyaga Marg Chanaky apuri, New Delhi-21, India.

International Public Works and Building Exhibition EXPOMAT, Le Bourget Airport, Paris, France, May 1972.
Information: M. le Prince, 1 Avenue Niel, 75-Paris 17e, France.

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No. 14 - February 1972

NINTH INTERNATIONAL WATER SUPPLY CONGRESS 1972

The International Water Supply Association will hold its Ninth International Water Supply Congress and Exhibition at the New York Hilton Hotel, New York, U.S.A., from September 11 - 14, 1972 during which the American Water Works Organization will act as host organization.
The scientific program will include technical reports on 12 important subjects of interest to the water supply field. Special sessions will be organized by I.W.S.A.'s International Standing Committees on the Study of Corrosion and Protection of Underground Pipelines; Water Quality and Treatment; Education and Training of Waterworks Personnel; Distribution Problems; Problems of Water Supplies in Developing Countries and by the Special Commission on Pollution and Protection of Water Resources and the Expert Group on Chemical Aids to Coagulation.
In the International Standing Committee on Problems of Water Supplies in Developing Countries, I.R.C. will present the "Water Supply Situation in Developing Countries and the Contribution of the W.H.O. International Reference Centre for Community Water Supply".
An International Exhibition of Equipment and Services used for the purpose of public water supply will be an important feature, while an exhibition of equipment and services for the industry will be staged as an integral part of the Congress.
For information, contact the Secretary General I.W.S.A., 34 Park Street, London W.1., England.

W. Germany

ADDITIVES INCREASE OUTPUT IN HYDRAULIC SYSTEMS

Since the discovery that addition of some parts per million of high polymers and soaps can considerably reduce friction losses in hydraulic systems, a new technology has developed after intensive research work in recent years, resulting in important applications such as in the transport of oil, hydraulic transport of coal, in sewer flow control etc.
The Institute for Hydromechanics of the University of Karlsruhe has summarized the fluid mechanic properties of solutions with additives such as Guar Gum, Polyethyleneoxyde, a complex soap (cetyltrimethyl-ammoniumbromide-naphtol) etc., and indicates the numerous possibilities of their application.
Energy loss reduction up to 70% for example can be obtained in a pipeline by using 20 p.p.m. polyethylene oxyde.

WATER SUPPLY STANDARDS - DIN TASCHENBUCH 12

Increased needs of drinking water from sources wich are more and more polluted make a revision of previous standards necessary.
In this new edition which is published by DNA (Deutscher Normen Ausschuss) Berlin, some 80% of the standards have been revised.

U.S.A.

PELLETIZED ACID FOR CLEANING WELL SCREENS

The use of pelletized acid instead of liquid hydrochloric acid for cleaning plugged well screens is said to eliminate the transport and handling of liquid acid, reduce the hazards of acid treatment and eliminate the needs for cumbersome pipe or hose arrangements in conducting liquid acid into the well screen. These pellets sink to the bottom of the well and dissolve readily into a strong solution.

CONTRACT FOR PROTOTYPE BRINE DESALTER

The Department of Interior's Office of Saline Water has announced the award of a $145,000.- contract to Envirogenics Company of El Monte for the design, construction and testing of a prototype distiller for the recovery of fresh water from hot geothermal brine. It is the largest contract yet awarded by OSW for research in overcoming the many problems involved with the distillation of geothermal fluids. Under the 12-months contract, Envirogenics will develop and operate a skidmounted flash plant using simulated brines. Geothermally active zones are to be found around the world.

A.W.W.A. PUBLICATION

The American Water Works Association has announced the publication of a new manual: G.J. Angele Sr., "Cross Connections and Backflow Prevention (No. S106)", which is aimed at nearly every occupation in the water utility industry, particularly managers, operators and technicians. It treats among others, water supply safety, backflows, backsiphonage and cross-connection control programs.

News from W.H.O.

RURAL WATER SUPPLIES IN AFRICA

To stimulate the construction of more facilities for safe and ample water supplies in Africa, W.H.O. organized a seminar on Community Water Supply at Brazzaville from 21 to 27 April 1971. Thirty-one senior officials from 27 African countries took part.

The seminar called for more emphasis on rural water schemes and felt that each country should set up a single water authority to give leadership and direction to national water programmes. As a general principle, it considered that water should be paid for by the user. In villages where incomes are low, the construction of water facilities should be subsidized but the people should contribute voluntary labour.

To meet the increasing need for waterworks personnel of all categories, the seminar recommended that, whenever possible, both professional and sub-professional workers should receive their basic training in the region, taking into account the real needs of African countries and the tasks they would eventually perform. It appealed for the use of local materials in all waterworks projects and stressed the need for research on materials and construction. W.H.O. is now helping to set up centres for applied research, demonstration and training to develop simple solutions to local water supply problems.

Through health education programmes, villages must be convinced of the value of safe water, as well as the dangers of using water from traditional sources. In this way, they would take more interest in the upkeep of the installations.

Training facilities for national technical personnel should be an integral part of externally financed projects and the importance of small and unspectacular projects needs to be borne in mind, since they have a considerable impact on health and economy.

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newsletter

No. 15 - March 1972

News from I.R.C.

PLASTIC PIPE STUDY

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. Unplasticized polyvinylchloride and polyethylene are two such materials and work is proceeding on the compilation of standard specifications and test procedures to ensure that only harmless plastics are used for drinking water.
Information on standardization activity concerning quality requirements, delivery directions, directions for use, dimensions of plastic pipe, has been requested by I.R.C. from national standards institutions. Till the end of January 1972, information, standards and specifications for plastic pipe have been received from the following countries: Belgium, Canada, Colombia, Denmark, Finland, Federal Republic of Germany, Ghana, India, Iran, Irak, Ireland, Israel, New Zealand, Norway, Philippines, Republic of South Africa, Spain, Sweden, Switzerland, Thailand, United Arab Republic, and United Kingdom.
In order to assist the developing countries in establishing their own plastic pipe standards, a report on existing standards for plastic pipe in water supply systems will be elaborated during 1972.

Belgium

ARTIFICIAL GROUNDWATER RECHARGE THROUGHOUT THE WORLD

The results of a world-wide survey of the artificial recharge of groundwater by the International Association of Scientific Hydrology (IASH) have been published in a 762 page volume, entitled "International Survey on Existing Water Recharge Facilities",
Ordering should be made through the General Secretary, Association Internationale d'Hydrologie Scientifique, 61 Rue des Ronces, Gentbrugge, Belgium.

Israel

EPIDEMIOLOGICAL AND TOXICOLOGICAL ASPECTS OF NITRATES AND NITRITES IN THE ENVIRONMENT

In the studies in the Environmental Health Laboratory of the Hebrew University - Hadassah Medical School, on infant methemoglobinemia in areas being supplied with water containing nitrates between 70 - 90 p.p.m., no significantly raised level of methemoglobin was found. This is probably due to the fact that almost all infants in Israel are either breast fed or weaned with cow's milk rather than powdered milk mixed with tap water.
Distinct pathological changes were found in the lungs and heart of rats which were provided with 1000 p.p.m. of sodium nitrite in their drinking water for 2 years. It was also demonstrated that nitrite was passed through the placenta and appears in the foetus minutes after being fed to the mother. The foetus could develop methemoglobinemia in the womb. Rats exposed to 100 - 300 p.p.m. $NaNO_2$ in drinking water over a 4-months period show distinct brain electrical activity changes (EEG) indicative of toxic effects which appear to be irreversible.

U.S.A.

WATER QUALITY GUIDELINES UPDATED

The 1968 Water Quality Criteria, which is a basic reference used in setting federal, state water quality standards is being revised and updated by the National Academy of Sciences under a contract awarded by the Environmental Protection Agency.
The new edition will have broader scope with more emphasis on public health and will include additional information as well as more extensive review of existing literature on water quality.
The Committee is subdivided into six panels for determining water criteria with regard to public water supplies, agriculture, industry, marine life, freshwater life, and recreation and aesthetics.

ALGAL REMOVAL BY ALUM COAGULATION

The Illinois State Water Survey, Urbana, Illinois, reports on an investigation on

the removal of algae in natural waters by coagulation with alum using the jar test technique.
The efficiency of algal removal was found to be dependent upon alum dosage, initial algae concentrations and the types, shapes and other specific characteristics of the algae. Optimum coagulant dosage for algae reduction was found to be similar to that for turbidity removal. Results should be useful in defining problems encountered in water treatment plants where algae are troublesome.

News from W.H.O.

INTERNATIONAL STANDARDS FOR DRINKING WATER 3rd EDITION, 1971

Above standards were first published by W.H.O. in 1958 as an aid to the improvement of water quality and treatment. The standards have been adopted in whole or in part by a number of countries as a basis for the formulation of national standards and were cited in the International Sanitary Regulations as applicable in deciding what constitutes a pure and acceptable water supply at ports and airports.
In 1963 a second, revised edition of the International Standards was published. Increasing knowledge of the nature and effects of various contaminants and improved techniques for identifying and determining their concentrations have led to a demand for further revision of the recommendations. Accordingly W.H.O. convened an Expert Committee in Geneva in March 1971 and this third edition is the outcome of the Committee's deliberations.
The present volume is considerably shorter and more manageable than the second edition, more than two-thirds of which was devoted to a detailed description of approved methods of water examination. As these appear in other readily available publications, the present edition simply refers the reader to descriptions published elsewhere. Certain other material has been omitted, such as the list of suggested subjects for research, and less space is devoted to the evidence considered by the Committee when recommending limits for the concentrations of individual substances.
The publication of this revised edition of "International Standards for Drinking Water" should stimulate further investigations of such problems as the provision of safe and potable water to all communities, the function of water quality in maintaining public health and reducing disease, and the improvement of treatment processes to ensure the maintenance of high standards in water supplies to consumers.
It was appreciated that a limited number of research workers and others might wish to refer to the reasoning which prompted the Committee to recommend certain criteria in the third edition of the International Standards for Drinking Water and this rationale has been incorporated in the report of the Expert Committee which, although not to be published in the Technical Report Series of W.H.O. will be available upon request, either from W.H.O. Geneva, or W.H.O. International Reference Centre for Community Water Supply, The Hague, to those interested.

Congresses and Symposia, 1972

United Nations Conference on the Human Environment, Stockholm, Sweden,
5 - 16 June 1972.
Information: Mr. M.F. Strong, Secretary General, U.N. Office, Geneva, Switzerland.

6h International Conference on Water Pollution Research, Jerusalem, Israel,
18 - 24 June, 1972.
Information: Israel Host Committee, P.O. Box 16271, Tel-Aviv, Israel.

National Symposium of Hydrology, Fort Collins, Colorado, U.S.A.,
19 - 21 June, 1972.
Information: The American Water Resources Association, Colorado, State University, Fort Collins, Colorado, U.S.A.

Ninth International Water Supply Congress and Exhibition, New York Hilton,
New York, U.S.A., 11 - 15 September, 1972.
Information: Secretary General, I.W.S.A, 34 Park Street, London W.1., Great Britain.

Annual American Water Resources Conference, Washington D.C., U.S.A.
25 - 28 October, 1972.
Information: F.E. McJunkin, Department of Environmental Sciences and Engineering, University of North Carolina, Chapel Hill, North Carolina 27514, U.S.A.

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newsletter

No. 16 - April 1972

News from I.R.C.

COLLABORATING INSTITUTIONS

One of the objectives of the Newsletter is to disseminate information on current research and development activities in the field of community water supply. This applies particularly to research being done by the institutions collaborating in W.H.O.'s Research and Development Programme on Community Water Supply. It is therefore essential that collaborating institutions, if they are keen on knowing what goes on elsewhere, must themselves supply information to the I.R.C. about what they are doing. We would welcome receiving monthly information sheets from each collaborating institution, giving briefly their activities during the month and their planned activities in the near future in the field of community water supply research, development, training and data collection. No long, time-consuming reporting is needed; a half-page abstract would do.

Great Britain

USE OF ANAEROBIC LACTOBACILLI IN WATER EXAMINATION

The possibility of using Anaerobic Lactobacilli as alternative bacterial indicators of pollution particularly in tropical water supplies is being studied with the support of a research grant from W.H.O. at the Department of Civil Engineering, University of Newcastle upon Tyne. A standard test for these organisms has been developed and used in England and in Kenya, and the organism appears to have a very similar distribution pattern to Escherichia coli type I. Reprints of an article on these distribution studies will soon be available. A further field survey in Morocco with the cooperation of the Regie des Exploitations Industrielles and the Organisation Mondiale de la Santé in Rabat should help to establish the value of this indicator in situations where E.coli is unsuitable.

Japan

SLUDGE DISPOSAL

Disposal of sludge from water purification plants is becoming the most difficult problem in Japanese Water works.
Whereas some large treatment plants process their sludges for sanitary disposal, others discharge these wastes untreated into the river, thus causing pollution.
Last autumn a Sludge Disposal Committee was set up by the Japan Water Works Association to recommend ways on sludge disposal. Attention was mainly centered around sludge dewatering and chemical treatment; the Committee will work for one year.

The Netherlands

CENTRAL SOFTENING

With an increased use of hot water apparatus, etc. in modern society, the economic disadvantages of using hard water are becoming more evident.
A Committee on Central Softening of the Testing and Research Institute of the Netherlands Waterundertakings KIWA Ltd., was asked to study the matter and investigate the possibilities of central softening. Extra costs for more soap, detergents and for extra maintenance due to the use of hard water have been estimated. A cost estimate for softening by various processes is also given.
Softening in a central treatment plant not only shows savings and environmental hygienic advantages, but it also gives a better guarantee for getting water of a good quality.
There seems to be circumstantial evidence to suggest that soft water is linked to an increased incidence of cardiovascular disease and research is being conducted in several countries to try and establish whether such a relationship exists.

South West Africa

DRINKING WATER FROM SEWAGE

As described in the January 1972 issue of "Water", inhabitants of the City of Windhoek, South West Africa are the first ones who permanently get purified sewage from their taps.
Sewage is first treated in a conventional sewage treatment plant (biological filters, settling tanks). High pH of 8.8 - 9.5 is reduced by dissolving CO_2 gas.

Algae is then removed by flotation and air is dispersed into the water so that detergents can be scraped off from the surface as foam.
After chemical treatment consisting of lime and alum treatment and breakpoint chlorination, the settled and filtered water may pass an active carbon filter before being pumped to the drinking water reservoirs.
Total investment amounts to US $300,000. and with an output of 200 cu.m/hour the plant produces drinking water at a cost of $0.13 per cu.m.

U.S.A.

WATER WELL MANUAL

A practical guide for locating and constructing wells for individual and small community water supplies by Ulrich P. Gibson and Rexford D. Singer covers the fundamentals of the occurrence and movements of groundwater; location, design, construction and maintenance of water wells, pumping equipment, and sanitary protection of groundwater supplies.
Originally published by the Agency for International Development of the U.S. Department of State to assist people living in the developing countries of the world who are without adequate supplies of good quality water, it is now available through Premier Press, Berkeley, California.

Publications (obtainable at the mentioned institutions)

Abstracts of Indian Literature in Public Health Engineering, no. 1, January 1972, from Central Public Health Engineering Research Institute, Nagpur, India.

N.G. Gruener, and H.I. Shuval, Health Aspects of Nitrates in drinking water; and

H.I. Shuval, Detection and Control of Enteroviruses in the Water Environment; both from the Environmental Health Laboratory, Department of Medical Ecology, Hebrew University, Hadassah Medical School, Jerusalem, Israel.(Proceedings of the International Conference on Water Quality and Pollution Research, Jerusalem, 1969).

R.C. Singh, Facts and Fallacies about Biochemical Oxygen Demand and Modern Development, from Indian Institute of Technology, New Delhi. (Journal of the Institution of Engineers, India, October 1971).

Symposia and Exhibitions

Symposium on the problems of Water Resources, Carlsbad, 23 - 25 May 1972.
Information: Ing. J. Milosova, Dum Techniky CVTS, Gorkehonám 3, Prague 1, Czechoslovakia.

Second International Exhibition "Man, Air and Water", technical problems on water and International Conference on Water, Air, Noise, Environment, Paris 2 - 8 June 1972.
Information: Techno Expo, 8 Rue de la Michodière, 75-Paris 2e.
(The original schedule of April 11 - 15 as referred to in the January Newsletter has been changed as mentioned, in order to include the Conference in the First International Environment Week).

1st International Exhibition of Techniques and Equipment against Pollution, Padua, Italy, 13 - 17 June 1972.
Information: SEP-Pollution, 35100 Padova, Via N. Tommaseo 59, Italy (rescheduled in connection with the general elections, see also January Newsletter).

Rectification

The "International Survey on Existing Water Recharge Facilities" should be ordered with the Treasurer International Association of Hydrological Sciences (IAHS), Mr. Ralph N. Wilson, 12903 Paca Drive, Beltsville, Maryland 20705, U.S.A. (cf March Newsletter).

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newsletter

No. 17 - May 1972

News from I.R.C.

Responding to a questionnaire regarding our Newsletter in which comments are requested, amongst others on contents and layout, many readers voted for a more handy and standard size.
We are glad to comply with this request and from May on our Newsletter will present itself in its new shape.
At the same time a mechanized handling of the mail is introduced, so that a prompt delivery can be secured.

Federal Republic of Germany

REMOVAL OF CARCINOGENIC SUBSTANCES FROM WATER

To the chemical substances in drinking water that are potentially hazardous to health belong the carcinogenic polynuclear aromatic hydrocarbons (P.A.H.) which stem from vegetable sources or are a result of pyrolytic processes.
According to a report by J. Borneff (Safeguarding the Wiesbaden water supply, Stadtwerke Wiesbaden AG, 1971), about one third of these aromats found in river water are present as particles, one third is finely dispersed, while the balance is dissolved. In modern purification plants about two third is removed by sedimentation, coagulation and filtration while oxidation or carbon filtration can strip the rest to harmless concentrations.
Tests were carried out in a pilot plant to check the efficiency of removal in the subsequent processes, which were confirmed in actual practice. With respect to these aromats the WHO International Standards for Drinking Water, 3rd ed., 1971, advise to have at least one centre in each country or region capable of carrying out investigations on P.A.H. in drinking water, especially originating from treated surface waters.

India

PREVENTIVE MAINTENANCE OF WATER DISTRIBUTION SYSTEMS

A training course on Preventive Maintenance of Water Distribution Systems held in Bombay from January 31 to February 19, 1972 was organized by the Central Public Health Engineering Research Institute of Nagpur in collaboration with the World Health Organization. Attention was focussed on problems such as Field Studies of Distribution Systems, Waste Assessment and Control and Biological Assessment and Control.
Sponsored by the W.H.O., Mr. R.A. Chisholm, Chief Distribution Engineer and Mr. D.C. Bowler, Biologist, both of the Water Research Association, U.K., took active part in planning and conducting the course of which the material has been compiled to a booklet.
Please contact Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-10, India, or The Water Research Association, Ferry Lane, Medmenham, Marlow, Bucks. SL7 2HD, England, for further information.

The Netherlands

LIMNOLOGY OF STORAGE RESERVOIRS

In the dry period, extraction of surface water for drinking water supply from the rivers Rhine and Meuse is limited, either due to deterioration of the quality or for quantitative reasons.
For the supply of drinking water for the Netherlands, storage reservoirs will therefore be required and the problems involved have been a subject of study by KIWA and the Government Institute for Drinking Water Supply, of which a report has been published.

While mineralisation of organic matter and nitrification of ammonia improve the quality, deterioration takes place by algae, so that pretreatment of the water in the reservoir will be necessary.
In existing shallow basins, algal growth can be depressed by fosfate removal in a coagulation or softening process, which is attractive for retention times of 6 months or longer. If retention times are less than 4 weeks, massal algal growth will not take place. For deep basins (20 - 30 m), light limitation by mixing over a great depth is an alternative method, while anaerobic conditions in deep reservoirs causing undesirable chemical reactions, should be taken care of.
Problems which may be studied on existing shallow basins are accumulation of toxic substances, oxygen balance, virus removal, taste and odor control, etc. For investigating the effect of mixing on algal growth and chemical stratification (due to anaerobic conditions), experiments with models will be required.

United Kingdom

THE RAPID DETECTION OF BACTERIA IN WATERS

The filtration of large volumes of relatively unpolluted water through Membrane Filters and subsequent incubation in a small volume of broth medium can permit the rapid growth of the bacteria trapped on the filter. In addition, it has been shown that short periods of incubation on pads soaked in medium are sufficient to permit the production of microscopically-visible colonies by the bacteria trapped on the filter. The use of selective media and appropriate bacterial-species fluorescent antiserum has been shown to permit the rapid identification of Group D streptococci and selected serotypes of E.coli by these methods developed at the Department of Civil Engineering, University of Newcastle-upon-Tyne. It is hoped that their use will enable the rapid detection of low levels of faecal pollution in drinking water supplies and other water samples.
In addition, the detection of numbers of live bacteria in water supplies immediately after chlorination can provide information as to the effectiveness of the chlorination process. A rapid technique for the detection of live bacteria in water samples has been developed. Large volumes of water may be filtered through non-autofluorescent membrane filters and stained with a solution of Acridine Orange at a predetermined concentration. Examination of the filter by high power fluorescence microscopy permits the rapid differentiation of live and dead bacteria trapped on the filter.

U.S.A.

LARGE FIBER MODULES FOR REVERSE OSMOSIS

Work on the design and testing of large hollow fiber modules for converting sea water to potable water is underway at Dow Chemicals Walnut Creek Research Center. Dow has just been awarded a $73,641 contract by the Office of Saline Water for work on a module capable of producing 2,500 - 3,000 gpd of fresh water from sea water. The hollow fiber modules are composed of melt spun cellulose triacetate fibers bundled together to that sea water can flow around individual fibers at high pressure. The fresh water permeates through the walls of the fibers. The modules are designed to reject more than 99 per cent of the salt in the sea water.

Congresses and Exhibitions

International Conference and Exhibition (Water pollution, purification, sludge treatment, protection, etc.), Jönköping, August 28 - September 3, 1972.
Information: ELMIA AB, Box 6066, S 550-06 Jönköping 6, Sweden.

International Congress "Chemical Engineering in the Service of Man" (water, atmosphere, waste, etc.), organized by the European Federation of Chemical Engineers, Paris, 2 - 9 September 1972.
Information: Secrétaire Société de Chimie Industrielle, 80 Route de St. Cloud, 92, Rueil Malmaison, France.

First Pacific Congress on Chemical Engineering PACHEC 1972 (mainly air and water pollution), Kyoto, 11 - 14 October 1972.
Information: Secretary of the Society of Chemical Engineers, Japan, Kyoritsu Bldg. 6 - 19, 4-Chome, Kohinata, Bunkyo-ku, Tokyo, Japan.

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No. 18 - June 1972

Czechoslovakia

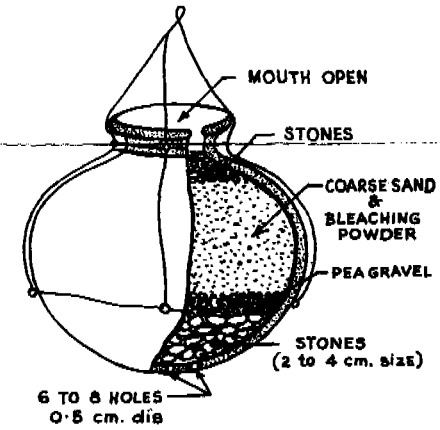
STANDARDS FOR SURFACE WATER PROPOSED

A new standard for surface water to be treated and used for community water supply is being prepared in Czechoslovakia. It is intended to facilitate planning and operation of waterworks, while a better quality of drinking water may be expected. Furthermore, accepting the standards will discourage further pollution of Czechoslovak streams and reservoirs which are important for community water supply.

India

CHLORINATION POT

Open dug wells still form a major source of rural water supply in India, in which the water is invariably polluted. To improve health conditions, The Central Public Health Engineering Research Institute, Nagpur, India has developed a simple earthenware chlorination pot which can effectively chlorinate wells up to 3 weeks. For community wells of 9,000 to 13,000 litres content and daily draw off of 900 - 1,300 litres (for 40 - 60 people) a pot of 7 - 8 litres capacity which is lowered into the well, will give adequate chlorination for 2 weeks (0.1 - 0.2 p.p.m.). The pot is filled with a mixture of 1.5 kg of bleaching powder and 3 kg of coarse sand, which is sandwiched between two layers of gravel. Chlorine is leached out through holes in the bottom. Addition of Na-hexametaphosphate (5% by weight of bleaching powder) helps in prolonging the chlorination period by keeping the mixture soft. For small household wells a double pot system with a lower chlorination rate is suggested. Further information can be obtained from The Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-10, India.



Single Pot System

Netherlands

NEW RESEARCH LABORATORY

The Testing and Research Institute of Netherlands Waterundertakings KIWA Ltd., our Dutch Collaborating Institution has been extended with a new research laboratory including a hall for pilot scale experiments, chemical laboratories, facilities for mass spectrometry and gaschromatography, etc.
Research work will be carried out in the field of desalination, investigation of organic matter, filtration as well as development of analytic procedures, etc. in community water supply.

Norway

NORWATER

With respect to a newsitem in our May 1971 issue mentioning NORWATER a new export product from Norway, the Department of Sanitary Engineering and Environmental Pollution of the National Institute of Public Health, Oslo, Norway advised that strict regulations apply on drinking water, which is to be sold; that water sources are under control of the Institute and that the water exported in cartons, bags, etc., has a high quality.

U.S.A.

INJECTION STORAGE TESTED IN NORFOLK

A test to store water by injecting it through wells into water-bearing subsurface rocks beneath Norfolk, has been carried out successfully by hydrologists of the U.S. Geological Survey of the Department of the Interior. In a recent trial, water scientists injected about 200,000 gallons of fresh water into a natural underground reservoir containing brackish water. The reservoir underlies the Norfolk area at a depth of about 950 ft and consists of an 80 ft thick bed of sand. After leaving the fresh water in the reservoir for 16 hours, the scientists were able to recover more than 75 per cent of it. It is hoped that eventually hundreds of millions of gallons of fresh water can be stored underground and held in reserve, perhaps for several years. Pumping fresh water into the brackish water bearing sand, does not mean that the fresh water becomes contaminated. Rather the fresh water tends to push the brackish water away from the injection well and form a bubble of fresh water. Thus a large percentage of the injected water can be available for recovery when needed.

EPA DRINKING WATER STANDARDS BOARD REVIEWS PROPOSED QUALITY STANDARDS

Maximum allowable levels for a number of minerals and elements found in drinking water were agreed upon by the Environmental Protection Agency's Advising Committee on Revision and Application of Drinking Water Standards at a meeting on January 10-12, although local Governments may have their own standards.
To increase test stringency the standard water quality sample was changed from 50 ml to 100 ml with a coliform bacteria limitation retained at 1 per 100 ml. Maximum allowable limits are 5 parts per billion of mercury (0,005 mg/liter), 270 micrograms per liter of sodium, 0,10 mg/liter of cadmium. It was noted that cadmium like mercury has a tendency to accumulate instead of being eliminated by consuming organisms. It was agreed on a standard of radiological quality of 1 pica Curie per liter (pCi) for alpha activity and 1 pCi per liter for radium 226 when the gross activity is greater than 1 pCi but less than 10 pCi per liter. Nitrate levels were recommended to be held at a maximum of 10 mg/liter, because of the tendency of nitrate to be converted by digestion to nitrite in infants, causing a reduced oxygen transport which may result in fatalities.

WATER POLLUTION AND HEALTH

This publication of Water Quality Research Council, 330 So. Naperville Road, Wheaton, Illinois, presents the complete proceedings of the Fifth International Water Quality Symposium held in Washington D.C., August 1970. Questions considered are for instance: Is there a link between water and heart disease? Do we need water's minerals? Might some metals be added to water to benefit health? etc. Further sections are devoted to water quality requirements for food and beverages, for personal grooming and beauty, and for medicine.

Congresses and Symposia

Two meetings will be held on the campus of Colorado State University, Fort Collins, Colorado, U.S.A.:

The Second International Symposium in Hydrology (September 11 - 13, 1972) will cover: Floods, Droughts, and Decision Making in inadequate Hydrologic Data.

The First International Conference on Transfer of Water Resources Knowledge (September 14 - 16, 1972) will cover two interrelated subjects "Transfer of Knowledge from Research to Practice" and "Transfer of Knowledge from Developed to Developing Countries".

Rectification

The Annual American Water Resources Conference should be held in St. Louis, Missouri, from October 30 to November 2, 1972.
Information: Dr. T.A. Harbaugh, Civil Engineering Department, University of Missouri-Rolla, Rolla, Missouri 65401, U.S.A. (cp March 1972 issue no. 15).

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newsletter

No. 19 - July 1972

India

CHOLERA CONTROL BY IMPROVED ENVIRONMENTAL SANITATION

The seventh cholera pandemic started in South-East Asia in 1961 and spread over large territories of this continent and reached the WHO European Region in 1970. This is the background of the discussion at the WHO Regional Committee Meeting in Madrid (September 1971), followed by a Conference on Cholera in Copenhagen in December 1971. Experience gained during the last decade showed that high standards of environmental sanitation, water supplies, excreta disposal, food control and a high level of personal hygiene are the most effective obstacle to the spread of cholera (WHO Wkly epidem. Rec. No. 1, 1972, p. 1-3).
A paper by T.R. Bhaskaran et al. on "Chlorination of Unfiltered Water Supply as an Interim Measure for Control of Cholera in Calcutta" was presented at the Symposium: Problems in Water Treatment, which was organized by the Central Public Health Engineering Research Institute, Nagpur, India in October 1964. The presence of a dual water supply for the City of Calcutta including an unfiltered river water supply intended for flushing, fire fighting and washing, provided a potential danger of entry of cholera into the City. Replacement of the latter with a filtered supply not only requires sizeable capital investment, but will need time. Laboratory experiments meanwhile indicate that chlorination leaving a residual of 0.5 p.p.m. after 10 minutes contact time, would destroy cholera vibrios added to samples of turbid river water (600 - 1000 mg/ltr) to the order of 50,000 organisms per ml and that doses of 2 - 3 p.p.m. chlorine throughout the year were sufficient to obtain said residual. Installation of chlorinators at the pumping stations as an immediate measure for controlling cholera proved effective in maintaining adequate residuals throughout the distribution system, in destroying cholera vibrios and the salmonella group of organisms, while 99 per cent reduction of MPN of coliform organisms is obtained. Although successful as an interim measure to prevent the entrance of cholera and other gastro intestinal diseases into the City, it was advised to improve the unfiltered supply into a filtered and purified supply finally.
Above article should encourage others having similar experience to pass this on to I.R.C.

Federal Republic of Germany

POCKETBOOK ON WATER MANAGEMENT

Recently published is the 5th completely revised edition "Taschenbuch der Wasserwirtschaft" (German)(Publisher: Verlag Wasser und Boden, Hamburg, 1971). It covers the total field of water management and deals among others with: Principles, Planning, Management of Quantity, Quality, Protection from radioactive contamination, Biology, Soil Protection, Water Management in Developing Countries, Electronic Data Processing, Mechanisation, Automation, Rational methods in the construction, operation and maintenance of water works.

Switzerland

PILOT PLANT ON COMMUNITY WATER SUPPLY.

In Switzerland about 26% of the requirements of potable water is abstracted from lakes, whereas more than 40 water treatment plants have been built on the borders of the most important lakes during the last 25 years.
Methods of treatment generally applied however, were frequently based on practical knowledge. The pilot plant in Männedorf on the borders of Lake Zürich was built in order to study economics of a process with various combinations of several treatment stages available: microsieving; sedimentation (sludge contact); coarse sand filtration; fine sand filtration; two layer filtration; coated media filtration; treatment by adsorption; flocculation; oxydation; disinfection.

Unesco

INTERNATIONAL COURSES, FELLOWSHIPS AND SCHOLARSHIPS IN HYDROLOGY (3rd ED. 1972)

Above Unesco brochure is intended to help prospective participants to choose the hydrology course that best fits their requirements and to make use of existing scholarships and fellowships available to foreign students in several countries. It lists international postgraduate courses supported by Unesco within the framework of the International Hydrological Decade, scholarships and fellowships which are granted to foreigners by several countries within the framework of national teaching and development programmes, and detailed information on curricula, national training facilities etc.
Further information should be requested from the various addresses mentioned in the brochure, which is published by Unesco, Place de Fontenoy, 75-Paris 7e, France.

United Kingdom

FREEZE DESALINATION

The British Government has decided not to proceed with the building of an experimental freeze desalination plant near Ipswich (see Newsletter no. 9) which was scheduled for mid 1973. The plant was a joint project by the Water Resources Board and the U.K. Atomic Energy Authority in collaboration with Simon Engineering Ltd. Research and development and reappraisal of costs after authorization in March 1971 have shown that the process is basically sound, that one of the process stages requires further investigation and that plant costs will be higher than originally estimated.

U.S.A.

HYDATA

This publication of American Water Resources Association, 206 E. University Ave., Urbana, Illinois, is a monthly journal containing current tables of contents and lists of titles of the world's scientific and technical literature in the field of water resources, as well as titles of patents from the U.S. and other countries. It also gives schedules of conferences, meetings and announces AWRA publications.

NETWORK OF INFORMATION RETRIEVAL CENTERS

On-line information retrieval services will be made possible by a national computer network of retrieval centers for water resources information which are connected by remote terminals and telephone lines to a data base at the University of Oklahoma, containing 40,000 full text abstracts of published literature related to water resources.

WATER WELL CONSTRUCTION TECHNOLOGY

A State of the Art Report on current Water Well Construction Technology written by the National Water Well Association Research Facility with a grant from the Office of Water Resources Research of the U.S. Department of the Interior is nearing completion. Subjects discussed are: ground water contamination, rock drillability, drilling systems, formation evaluation, well design and well efficiency, well corrosion and incrustation, well stimulation, construction cost, analysis.

PLASTIC PIPE FOR DEVELOPING COUNTRIES

To meet with WHO's target in preparing for the Second UN development decade (1971-1980) and increase urban piped water supply for developing countries from 51 to 100% and for rural population from less than 10% to 20%, some US$9 billion will be required. Savings in cost of pipe which is a major cost element in water supply construction will affect substantial savings in overall investment.
Such is the background of F.E. McJunkin and Ch.S. Pineo's "Role of Plastic Pipe in Community Water Supplies for Developing Countries", which was written for the Agency for International Development, and singles out plastic pipe to be suggested for water supply piping because of its favourable cost and advantageous physical properties. The possibility of manufacturing the pipe in comparatively inexpensive and uncomplicated plants in the developing countries themselves, resulting in lower foreign currency expenditures, deserves attention.
Copies of above report may be requested from the Office of Health, U.S. Agency for International Development, Washington. D.C. 20523.
To get assurance that no health hazard is involved KIWA Ltd. of the Netherlands and the Water Research Association, Great Britain, are investigating the toxicity of stabilizers used in extruding unplasticized PVC.

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newsletter

No. 20 - August 1972

News from I.R.C.

In our Bulletin no. 1 "Community Water Supply Research 197 ", an inventory was given of research projects being undertaken by 28 institutions located in 21 countries and which are collaborating with our International Reference Centre in the community water supply field.
Such a compilation should give useful information to research workers and enable them to contact and exchange ideas with colleagues active in field of interest.
Bulletin no. 3 "Community Water Supply Research 1972" has now been published, listing another 29 research institutions in 12 countries, which together with Bulletin no. 1 gives a more complete picture of research activities indicated above.
Copies of this bulletin can be requested from the International Reference Centre for Community Water Supply, 13 Parkweg, The Hague, Netherlands.

Nigeria

RURAL WATER SUPPLY IN NIGERIA

Because of the uncertainty of available groundwater resources in The Basement Complex of Western State, Nigeria, surface water is the main source of domestic water supply.
A low success ratio attending previous bore hole programmes has led to the conclusion among practising water engineers that The Basement Complex is not a suitable source of groundwater supplies.
Studies at the Department of Geology, University of Ife, Nigeria have shown this conclusion to be unfounded and attributed to the practice of locating well sites by intuition. Scientific exploration giving information on the distribution of structural and geomorphic features should be the means of determining potential water zones in crystalline rocks. With the high rainfall and low surface run-off that is typical of the study area, a high rate of recharge into the overburden of the crystalline rocks is expected.
A high incidence of water-borne diseases is traceable to the utilization of highly polluted stagnant or slow-moving surface waters. This problem can be significantly minimized by a programme of rural water supply sing ground water from hand-dug wells.
Selection of suitable sites should be made by hydrogeologists and the drilling could there after be accomplished by community effort.

Thailand

SERIES FILTRATION USING LOCAL FILTER MEDIA

Local filter materials for rural drinking water supply were investigated at the Department of Environmental Engineering of the Asian Institute of Technology at Bangkok.
In a 2 stage series filtration, shredded coconut husk fiber was used in the roughing filter, filtering out turbidities from 200 - 400 JTU in raw water to a 20 - 60 p.p.m. effluent at filtration rates up to 2,5 m3/m2/hr. It seems that the fiber contains a natural polymer which aids in removing colloidal materials by adsorption. With a filtration rat of 1,25 m3/m2/hr a head loss of 1,20 m was reached after 160 - 200 hours. Due to deep penetration of particles in the filterbed it was more practical to replace the whole relatively inexpensive filterbed rather than cleaning it by backwash.
The effluent of the primary filter was led into the secondary or polishing filter which was filled with burnt rice husk which contains about 90 percent silica. Operation at filter rates of 0,1 to 2,5 m3/m2/hr showed 30% longer filter runs (of 220 - 30 hours) than a comparable sand filter resulting in effluents with less than 1 JTU turbidity. As penetration was superficial, scraping off the upper 3 cm of the medium was sufficient to clean the filter. Final addition of 1 p.p.m. chlorine finally gave a potable water supply of a good quality.

U.S.A.

INTERNATIONAL WATER RESOURCES ASSOCIATION

The International Water Resources Association (IWRA) was recently founded as a non-governmental non-profit scientific organisation with headquarters in Milwaukee, Wisconsin. It was the result of efforts of an international group of administrators, engineers, executives and scientists representing many disciplines of the water resources field. It will provide an international forum for discussing all aspects of water resources science and technology in an interdisciplin-

ary manner.
For information or membership forms, please contact Dr. G.M. Karadi, Secretary General IWRA, E 320, Science Complex Building, University of Wisconsin, Milwaukee, Wisconsin 53201, U.S.A.

AWWA MANUALS

New manuals of the American Water Works Association are:

1. Safety Practice for Water Utilities
   It offers the water utility programs, concepts and ideas designed to promote safe work practices and preclude unsafe work conditions for its personnel.
   It also suggests techniques for use in promoting safety in a variety of water utility work situations.
2. Basic Manual for Water Treatment Operators
   This is designed to serve students and teachers as a textbook and may be used in conjuction with training outlines for water treatment operators.

United Kingdom

FILTRATION RESEARCH GROUP

The International Consortium of Filtration Research Groups (INCOFILT) consists of a number of groups with the purpose of furthering knowledge in the field of filtration. It is a private organization devoted to the furtherance and coordination of fundamental studies in filtration through the exchange of research programmes, the holding of seminars and the organization of advanced study courses. An information centre on filtration will be established.
The group, whose Secretary is Prof. D. Freshwater of Longhborough University of Technology, Great Britain, met for the first time early this year in London.

U.S.S.R.

RESEARCH ON DISINFECTION IN THE U.S.S.R.

An article by S.N. Čerkinsky and N. Trahtman dealing with "The present status of research on the disinfection of drinking water in the U.S.S.R." has been published in the Bull. Wld. Hlth. Org. 1972, 46, 277-283. The article reviews recent research in the U.S.S.R aimed at evaluating methods of disinfecting drinking water and at elucidating the mechanisms involved. The use of chlorine, ozone and gamma rays is analysed; laboratory and field research on direct electrolysis of sodium chloride as a source of active chlorine is attracting attention. Advantages and disadvantages of the various methods and their effects on enterobacteriaceae and on enteroviruses are discussed.

W.H.O.

DATA ON COMMUNITY WATER SUPPLY.

Many national and international community water supply programmes are hampered by the lack of data on f.e. existing installations, possible new sources of water, costs and benefits to countries concerned, etc.
A scientific group convened by WHO in August 1971 recommended ways in which the collection and reporting of data on community water supply can be improved. The findings are reported in WHO, Techn. Rep. Series no. 490: "Techniques for the Collection and Reporting of Data on Community Water Supply", Geneva 1972. After a review of the subjects on which data are frequently lacking, the report outlines the various phases of water supply programmes and the types of data required at each phase.
Data on water sypply may be obtained from different sources and to make them available to the bodies requiring them for water supply programmes, a national centre responsible for collection and dissemination should be set up in each country. Although priority for the type of data may vary, certain minimum data should be available to governments.
It is advised to have some coordination between collectors and data users and uniformity of data presentation. Finally the value of data to demonstrate economic and health benefits of safe water supplies is stressed.

Conferences

Water problems will be discussed in the House of Chemistry (Paris) from 18 - 22 September 1972. Subjects to be analysed include: Needs and resources of water, Classification of waters according to their quality with respect to modern resources management, Variation in demand and their problems, Desalination and demineralization, Water pollution, Physics, Chemical and microbiological data, Evaluation of water pollution.
For additional information, please contact: Centre de Perfectionnement Technique, 80 route de Saint Cloud, 92 Rueil Malmaison.

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No. 21 - September 1972

HANDPUMPS IN RURAL AREAS

In document no. WHO/CWS/RD/69.1 on "The Village Tank as a Source of Drinking Water", previously distributed by I.R.C., several possibilities of hand pump construction are discussed, ranging from wooden constructions from the Philippines, Kenya and India to the inclusion of plastic pipe and tubing for plunger and pump cylinder.
It is believed that wide adoption of the use of handpumps which can be locally manufactured and repaired will be of great help in providing a sanitary supply of drinking water in rural areas of developing countries.
Reference to the historical development of the handpump is made in a publication by B.M. Eubanks, "The story of the Pump and its relatives" (available B.M. Eubanks, 406 Evans Ave., N.E., Salem, Oregon, U.S.A.)

Belgium

SLUDGE TREATMENT

R. Collienne reports in "La Technique de l'Eau et de l'Assainissement" of October 1971 on experiments on sludge treatment in the drinking water purification plant of Eupen. The dried sludge from the settling tanks consists of volatile matter - 30,1%; silica - 12,0%; MnO_2 - 2,4%; Fe_2O_3 - 4,7%; Al_2O_3 - 31,0%; $CaCO_3$ - 19,2% and MgO - 1,3%. Dry substance varies from 2,9 to 1,7%.
Freezing at -4°C followed by thawing gives a very clear supernatant liquor and a granular precipitate which is less than 10% of the original volume. Settling in a lake during some ten months, concentrates the dry substance to 23%.
Based on these encouraging results, decantation in two lakes with a total area of 12000m^2 will be planned, from which the settled sludge will be disposed of.

Canada

FILM CATALOGUE ON WATER

An international catalogue with information on more than 600 films in French on water technology and science will soon be published by CERDEAU-Films, Génie de l'Environnement Ecole Polytechnique, 2500 Marie-Guyard, Montreal, Quebec.

Great Britain

ANNUAL REPORT OF THE WATER RESEARCH ASSOCIATION

In its 17th Annual Report (1971), activities of the Water Resources, Water Treatment, Water Distribution, Economics and Member Services groups of The Water Research Association, Medmenham, Marlow, Buckinghamshire are reported, covering among other things water quality changes during infiltration; algal activity in stored water; identification of organic compounds in river water; studies of underground flow; movement of contaminants in water; coagulant aids; upflow-downflow filtration; sludge treatment; air flotation; removal of organic contaminants by ion-exchange; ammonia removal from river water; reverse osmosis; new analytical methods.
The Water Distribution Group has been concerned with the changes in the biological and chemical quantity of water when disinfected and distributed; the mechanism of service failures in pipe material was also studied. Work in the Economics Group aims at the improved design and efficiency of operation of water supply systems through the use of operational research and related mathematical models. The report was completed with a list of technical publications.
The International Reference Centre for Community Water Supply is looking forward to receive annual reports of its Collaborating Institutions in order to inform other scientists about their activities through this newsletter.

India

WATER CONSERVATION BY EVAPORATION CONTROL

In the tropical and partly subtropical climates of India, loss of water due to evaporation in storage tanks for irrigation and domestic water supply can amount to 2 - 2,5 m/

year. In connection with the irregular distribution of rainfall and limited supply of ground water, adequate protection from evaporation of available surface storage is essential. Certain organic compounds have the property of spreading on the water surface and forming a thin film, which is capable of expansion and contraction by wave action, leaving the film undamaged and offering resistance to the rate of evaporation of the water. Locally manufactured mixtures of cetyl and stearyl alcohol sprayed in amounts of 1,2 kg/hectare/day is found adequate for wind velocities below 8 km/h. Wind velocity and direction, temperature and humidity may influence this dose.
The degree of saving in evaporation achieved will depend mainly on the efficiency in covering the entire lake with a monomolecular film which in turn depends on wind velocity. Field tests by the Central Public Health Engineering Research Institute, Nagpur-10, India showed savings up to 30 percent reduction in evaporation losses at a cost of $0,01^5$ to $0,02 per cu.m. of water saved. (Technical Digest June 1972, no. 30)

Morocco

SANITARY ENGINEERING CENTRE, RABAT

The Sanitary Engineering Centre of the Ecole Mohammadia d'Ingénieurs at Rabat, Morocco, is giving a one year post-graduate programme in sanitary engineering.
Jointly established by the Government of Morocco and the World Health Organization, it is intended to serve the needs of some thirty French speaking countries in the world. Information about this French course for which WHO fellowships are available can be obtained from above Centre or from one of the WHO Regional Offices.

U.S.A.

NATIONAL GROUND WATER QUALITY SYMPOSIUM

Proceedings of the First National Ground Water Quality Symposium held August 1971, in Denver, Colordado, covering 15 major papers have been published in the November-December 1971 and January-February 1972 issues of NWWA's technical journal: "Ground Water".
The material is described in five subject areas: Ground water waste disposal recharge and reuse; Chemical contamination of ground water; Solid waste - its ground water pollution potential; Aquifer protection and rehabilitation; Ground water movement - quality relationships.

RURAL WATER SYSTEM DEVELOPMENT IN LOW INCOME AREAS

The U.S. Office of Economic Opportunity announced the funding of a major construction and research project to determine model methods of bringing home water supplies to 20 million Americans living in low income areas at present without running water.
The grant of nearly 2 million dollars made to the Demonstration Water Project Inc., Roanoke, Virginia will allow construction of four or five cluster well systems. Meanwhile the National Water Well Association Research Facility will make an engineering criterion study on the potential applicability of Cluster Well Systems versus Alternate Systems, in which economic, social, geographic as well as hydrogeologic factors will be taken into account. As a result small well systems may well be looked upon as a viable alternative to grandiose pipeline water schemes.

Symposia and Conferences

In view of the great interest in the lectures on special topics in water technology practice held up to now, the Institute for Water, Soil and Air Hygiene of the Department of Health, Berlin, the Institute for Water Chemistry and Chemical Balneology of the University of Munich and the Section of Water chemistry of the Engler Bunte Institute of the University of Karlsruhe have decided to hold these lectures annually.
A preliminary program is decided upon:

15-17 June 1972 in Berlin	: Water and insecticides
September 1972 in Karlsruhe	: Adsorption
Spring 1973 in Berlin	: Hygienic toxicologic evaluation of substances in drinking water
Spring 1974 in Munich	: Modern analytical methods in drinking water treatment practice
Spring 1975 in Karlsruhe	: Ion exchange

The annual course on water in Berlin will start again in the autumn of this year, while the one in Karlsruhe will be discontinued.

Errata

Some typographical errors slipped into the August Newsletter, viz., under News from I.R.C.: Bulletin no. 1: "Community Water Supply Research 1971" and ....colleagues active in a mutual field of interest.

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No. 22 - October 1972

News from I.R.C.

During the 9th International Water Supply Congress in New York last September, problems of water supply in developing countries were discussed. I.R.C. presented a paper which was partly based on a progress report on community water supply given by the Director-General of W.H.O. to the Twenty-fifth World Health Assembly which met in May 1972, mentioning the goals for the decade 1970 - 1980 on the base of the present water supply situation, and current and future programmes of W.H.O. In I.R.C.'s presentation a review was given of population growth, trends in community water supply and I.R.C.'s programmes for the near future. Sustained by other speakers, I.R.C. urged to put more stress on problems of water supplies in developing countries and discuss them during IWSA Congresses and connected seminars; furthermore to promote better contacts through the establishment of national associations. In a second
In a second paper by Mr. Harold R. Shipman of the World Bank, it was pointed out that not the reduction of standards of water quality or service will contribute to the solution of future financial problems of water supply, but good engineering, planning, operation, financial policy and management.
A lecture by Mr. A. Delloua then described a case history concerning water supply in Tunisia.
The ensuing discussions stressed the great need for extension of training programmes at all levels and for practical guidelines of planning and operation of water supplies.

I.R.C.'s Third Annual Report

The 1971 annual report of the International Reference Centre for Community Water Supply has been published, describing objectives, organization and activities in 1971 in the Centre's position as nexus in a network of 28 collaborating institutions engaged in research and development in community water supply. Activities consisted among other things of handling a large number of requests for information, inventories of research projects, literature and data compilation on plastic pipe, study of the degree of pollution of surface waters, development of a simple dosing device for desinfection, compilation of information on training courses and participation in expert meetings and working groups of W.H.O. and the International Water Supply Association.
A programme of activities planned for 1972 has been elaborated, covering e.g. the set-up of a documentation storage and retrieval system, the convening of an expert meeting on toxicity of uPVC pipes and coagulant aids, preparation of a paper on standards and guidelines for the use of plastic pipe, a compilation of design criteria for urban water supplies and promotion and extension of training facilities.
The feasibility of this programme will largely depend on collaboration of institutions within the network; input from individuals and organizations working in the field of water supply is anticipated. A copy of above report can be requested from I.R.C., 13 Parkweg, The Hague, The Netherlands.

Australia

SOLAR DISTILLATION

It has been confirmed theoretically and experimentally that surface layers of salt have a detrimental effect on output of distilled water by reducing the amount of radiation absorbed in a solar still. To maintain the productivity, it is necessary to remove this layer as its develops, the frequency of cleaning being dependent on the quality of the saline water and the rate of distillation.
Though this operation is in itself simple it is felt that a better solution will be to prevent initial formation of the salt layer.
At the Griffith field station of the CSIRO division of Mechanical Engineering, Highett, Vic., tests are made to determine the efficiency of treating the feed water with a complex phosphate compound. It is hoped that this will greatly reduce the rate of growth of the salt layers by retarding crystal nucleation. The tests have to proceed for a full year before conclusions can be drawn.

Great Britain

DETERMINATION OF IRON

An analytical method for determining iron using tripyridyl-triazine (TPTZ) as the coloring agent and specifying an absorptiometric technique was developed in the Water Research Association Laboratories, Medmenham, Marlow, Buckinghamshire. The method can be applied in a concentration range of 0.007 to 1.0 mg Fe/litre. Of 31 consituents investigated, Calgon interfered; this can be overcome by heating the sample. Analyses can be carried out with a speed of ten samples per hour.

WRA PUBLICATIONS

In the July 1972 issue of Water Research Newssheet the following publications of the Water Research Association, Medmenham, Marlow, Buckinghamshire, England are announced:

FM67 - Multiple resource studies
FM68 - Flow measurement in water mains by dilution gauging
TM69 - Some notes on calculating and measuring time of travel of contaminants in rivers
TP81 - A review of sludge treatment and disposal practice in the water industry
TP82 - Report of the investigation of backsiphonage risks in domestic properties: winter 1970 - 71

India

ANNUAL REPORT CPHERI 1971

In the annual report for 1971, the Director of the Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-10 (India), reported research and other activities of the Central Institute and its eight zoanl laboratories; among other things in the water supply field on natural and synthetic coagulant aids, defluoridation, development of a domestic iron and manganese removal unit, membranes for reverse osmosis, testing of bituminous coal in two-layer filters as a substitute for anthracite, leaching of toxic lead stabilizers from plastic pipes.
Recommendations of a Conference convened at Nagpur on Public Health Engineering needs in India are compiled in a booklet: "Research and Development Needs in Public Health Engineering in India".
In all, 165 research projects have been dealt with including those in other divisions, such as sewage, industrial wastes, air pollution, water pollution, microbiology, engineering, solid wastes, rural sanitation, instrumentation, etc. Of these, 48 projects were completed.
A list of symposia and seminars, publications and reports is included.

U.S.A.

PUBLIC HEALTH ASPECTS OF VIRUSES IN WATER

This publication edited in August 1971 by Norman A. Clarke of the Water Supply Research Laboratory, National Environmental Research Center, Cincinnati, Ohio 45268, U.S.A. lists current investigations on viruses in water in institutes in the U.S.A., India, Canada, United Kingdom, France, South Africa, Australia, Denmark, Netherlands, Federal Republic of Germany and Israel.

Symposia

A symposium on "Environmental Pollution" is scheduled for 9 - 11 January 1973 by the Central Public Health Engineering Research Institute, Nagpur in collaboration with the Indian Association for Water Pollution Control. Water treatment problems will be dealt with together with other topics on water pollution, sewage treatment, industrial waste treatment, air pollution control and solid waste disposal.
Information on this symposium can be obtained from: The Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-10, India.

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No. 23 - November 1972

News from I.R.C.

IODINE FOR DISINFECTION OF SMALL WATER SUPPLIES

Compared with chlorine, iodine has several attractive properties as a disinfectant in rural areas, such as easy handling, low solubility in water, good germicidal properties, use in wider pH range and less susceptibility to interference from ammonia and organic substances. In case of high initial iodine demands however, physiologically toxic levels of iodine may be reached. For this reason iodine application should be limited to emergency uses only.
A diffusion type of dosing unit has been developed using a cellulosic type of membrane to control the dosing rate. Complementary field tests by the Central Public Health Engineering Research Institute in India proved that the membrane unit was too delicate for practical application. A less delicate device with direct contact of the chemical and water but with less accuracy has been proposed.
Above I.R.C. Technical Paper no. 2 "The suitability of iodine and iodine compounds as disinfectants for small water supplies" by Mr. B.C.J. Zoeteman can be requested from our Centre in The Hague, the Netherlands.

Belgium

CHEMICALS FOR WATER TREATMENT

The March 1972 special issue of "La tribune du CEBEDEAU" gives a report of the Commission des Réactifs (Commission on chemicals) of the Belgian Centre for the Study of and Documentation on Water, Liège, which was composed of producers and users of chemicals for water treatment.
In this report useful data and information such as properties, field of use, chemical physical properties, production, packing and storing and analytical methods are given for alum, ferric chloride, sodium silicate, sodium chloride, sodium bicarbonate, caustic soda, hydrochloric acid, sulfuric acid, industrial phosphates.
For information please contact the Centre Belge d'Etude et de Documentation des Eaux et de l'Air, B-4000 Liège, 2 Rue Armand Stévart, Belgium.

Great Britain

SAFETY IN WELLS AND BOREHOLES

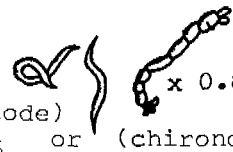
This joint publication of the Institution of Civil Engineers, the Institution of Water Engineers and the Society of Water Treatment and Examination and H.M. Inspectorate of Factories is a revised edition of the "Memorandum on Safety Precautions Recommended for Workers in Wells" published by the first mentioned institute in 1951. The purpose of the handbook is to draw the attention to precautions necessary for safe working conditions and to dangers that may arise. A chapter on precautions against the contamination of water, a list of references and a bibliography are included.

India

ORGANISMS ASSOCIATED WITH WATER SUPPLIES

Many of the public water supplies draw their raw water from surface sources, namely natural lakes, impounded reservoirs and rivers. These water bodies contain a heterogeneous assemblage of minute organisms, such as bacteria, algae, protozoa, rotifers, larvae, etc., and a variety of large forms such as sponges and molluscs. Normally these organisms are removed by conventional water treatment methods. It is only when they start proliferating in abundance during their seasonal life cycle or otherwise, that they become a source of nuisance and interfere with the treatment and distribution operations. Large colonies of some of these forms grow in the piping system of

treatment plants and distribution systems where they are not detected till the onset of nuisance such as colouration of water, taste and odour formation, clogging, etc. Plankton forms also impart characteristic taste and odour and interfere with water filtration by clogging sand beds.
CHPHERI collected samples from the water supply systems of some major cities of India. The results of their examination are tabulated below.

Organism		Nuisance	Occurence
1. Ceratium (protozoa)	 x 320	Odour	Reservoirs
2. Fragilaria (algae)	 x 320	Filter clogging	Rivers and Reservoirs
3. Spongilla (fresh water sponge)	 x 0,8	Choking of pipes	Distribution mains
4. Larvae	 (nematode) x 16 or (chironomid bloodworm) x 0.8	Aesthetic	Raw waters, outlets treatment operations
5. Polyzoa (pipe moss)	 x 320	Slimy growth in pipes, clarifiers choking, odour	Distribution mains and water treatment units
6. Molluscs (snails)	 x 0.8	Choking of pipes and meters, taste and odour	Water mains

Organisms such as snails are very difficult to eradicate once established in a water supply system. Heavy chlorination, at a stage of their life cycle when they are most susceptible, can be of help. Preventive maintenance of distribution systems by scouring and the recently tried "foam swab" method can keep the system in good shape. Addition of copper sulphate and prechlorination is widely used to control plankton forms. (CHPERI, Technical Digest, No. 29, May 1972.)
Part of the above studies were conducted by the United Kingdom's Water Research Association, under contract to the WHO Regional Office for South-East Asia, and in association with the Central Public Health Engineering Research Institute, Nagpur, and the Bombay Municipal Corporation. This assistance was made possible with funds from the WHO Special Account for Community Water Supply. A limited number of copies of the WRA's final report dated September 1972, on the "World Health Organization-assisted CPHERI Course on Preventive Maintenance of Water Distribution Systems" may be obtained from the Water Research Association, Medmenham, Marlow, Buckinghamshire SL7 2HD, England, or from the Community Water Supply and Sanitation Unit, World Health Organization, 1211-Geneva 27.
Arising from the course conducted in Bombay and some related research carried out in Calcutta, a manual was prepared by CPHERI on "Preventive Maintenance of Water Distribution Systems", Part III, 1972, of which a limited number are obtainable from the Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-10, India.

Italy

POST-GRADUATE COURSE IN HYDROLOGY

The UNESCO-sponsored Eighth International Post-Graduate Course in Hydrology with English and French as the official languages, will be held in Padova, Italy, from January to July 1973.
All enquiries regarding this course, as well as requests for information concerning fellowships, should be addressed directly to the organizers of the course:
- Corso Internazionale d'Idrologia
  Via L. Loredan 20
  35100 Padova, Italy

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No. 24 - December 1972

Gibraltar

DESALINATION

A 300,000 gal/day (U.K.) sea water distillation plant is under construction in Gibraltar using techniques developed by the U.K. Atomic Energy Authority and British Industry.
The plant will be of the multiple-effect type having 13 effects, with vertical double fluted tubes utilizing falling film evaporation to obtain high heat transfer rates, resulting in a reduced overall water production cost.
The distilled water produced will be pumped into the Gibraltar water supply system.

Great Britain

INACTIVATION OF VIRUSES WITH OZONE

Studies of the Department of Public Health Engineering, University of New-Castle-upon-Tyne indicate the relatively insignificant effect of temperature changes (5 - 25°C) and that of pH (6 - 8) on the rates of inactivation of Escherichia coli bacteriophage by ozone. Above viral model has been selected for the experiments as it has similar characteristics to Enteroviruses. The latter may be significant in a public water supply and may cause a variety of illnesses to man.
Organic material available however, seems to have a protective effect i.e. decreasing the inactivation effect of ozone at higher concentrations of organic matter.
Experiments with bacteriophage suspensions in sterile river water indicate that the virus particles are inactivated fairly rapidly even at low ozone concentrations.
Experiments are being conducted with a number of Enteroviruses and preliminary data confirm the expectation that viruses are much more resistant to ozonation than bacteria. Above research is reported by L. Evison in the "British Water Supply" of September 1972; the article concludes with the remark that further experiments are required, but that the indications so far obtained are that disinfection by ozonation should be able to eliminate viruses from any water supply.

PLAN FOR WATER METERS

A £500 million scheme to put water meters in every home in England and Wales is being drafted by the Environment Department, giving the planned Regional Water Authorities power to introduce the meters, when deemed necessary.
The Department is of the opinion that meters would help to regulate the volume of water used in each household and that the plan should be effective in overcoming any shortage anticipated.

India

LISTING OF PUBLICATIONS

"A Guide to Current Literature in Environmental Health Engineering and Science" is a CPHERI publication and is a fortnightly current awareness list covering titles of: papers published in the field of Public Health Engineering and related subjects appearing in about 250 scientific and technical periodicals. The aim of the publication is to present a medium for disseminating information in this interdisciplinary subject and to keep scientists informed about new research papers.
Subscriptions should be directed to the Central Public Health Engineering Research Institute, Nehru-Marg, Nagpur-10, India, while microfilms and photocopies of articles can be ordered from the Indian National Scientific Documentation Centre, Hill Side Road, Delhi-12, India.

Iran

REVERSE OSMOSIS

Reverse osmosis has been selected in Iran to provide two villages with drinking water from a brackish water source containing 3,500 p.p.m. total dissolved solids. The installation will be set up as packaged plants with 25,000 gal/day units using the compact DuPont Permasep permeator. The latter contains fine spun hollow polyamide fibres with a porous wall, strong enough to make an extra support unnecessary.
A standard Permasep-module of 130 x 1200 mm size contains more than 900,000 hollow fibres with a membrane surface area of 180 sq.m and a capacity of 8.5 cu.m/day purified water at a recovery of 75%. If used continuously the installation's life time can be as long as 5 years.
The reverse osmosis process is gaining importance, its use is expected to increase from a 3.5 million gallon installed capacity per day in 1971 to an expected 10 million gal/day in 1972.

Iraq

RURAL WATER SUPPLY FOR IRAQ

A WHO-United Nations Development Programme Project is underway for the preparation of plans for supplying 14,000 rural communities with 5 million inhabitants in Iraq with safe drinking water and for establishing a rural water supply authority. A more effective use of available resources is intended which will result in improved health conditions and productivity increase. Suitable designs will be selected with forecasts of population growth and water demands up to the year 2000 as a basis.

Netherlands

ANNUAL REPORT 1971 OF THE KIWA LTD.

In above annual report of the Testing and Research Institute of the Netherlands Waterundertakings KIWA Ltd. (P.O. Box 70, Rijkswijk 2109, the Netherlands) a review is presented of the fundamental and applied research undertaken for the benefit of the Dutch water undertakings. Problems of water supply from wells, limnology of storage reservoirs, underground storage by artitificial infiltration are studied.
In desalination, volatility of organic matter in flash evaporation and suitability of membranes in treating different types of water by electrodialysis and reverse osmosis are investigated.
Other studies include: methods of analysis and purification of water containing organic matter, oil removal and control of pesticides, oxidation of model substances, influence of changing water quality on biological and micro-biological aspects in the distribution system, reduction of organic matter on active carbon filters, concentration methods of viruses by polyelectrolytes, toxicity of pipe and coating materials and coagulant aids, water hammer in long horizontal pipes. Although it is acknowledged that a substantial amount is being spent on research, it should still be raised from the present less than 1 percent to 1 to 2 percent of the gross income of the water undertaking.

Paraguay

NEW METHODS OF WATER TREATMENT.

A Symposium on New Methods of Water Treatment was held in Asunción, Paraguay in August of this year.
Organized by the Pan American Health Organization, Washington D.C. and the Pan American Centre for Sanitary Engineering and Environmental Sciences (CEPIS) of Lima, Peru, it dealt with the following subjects: state-of-the-art of coagulation, accelerated settling, solids contact reactors, modern concepts in water filtration, new ideas in filter control systems, simple water treatment plants for Latin America, capacity increase of filtration plants, economic impact of new treatment processes.
Proceedings of the symposium are published by the Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente (CEPIS), Lima, Peru.

News from W.H.O.

From 13 to 17 November 1972 the World Health Organization convened a meeting which was attended by Directors of 18 selected WHO Collaborating Institutions for Wastes Disposal who were invited out of 44 institutions collaborating with the WHO International Reference Centre for Wastes Disposal. The International Reference Centre for Community Water Supply was represented by its Manager, Mr. J.M.G. van Damme.
The meeting was held at the Federal Institute for Water Resources and Water Pollution Control, Dübendorf, Switzerland, the host institute of the International Reference Centre.
The participants reviewed the progress of work of the Centre since its establishment in 1968, exchanged research experience, formulated a long-term research and development programme, and indentified specific areas where collaborative research could be intensified.