



No. 25 - January 1973

I.R.C. in 1972

Looking back at I.R.C.'s activities in 1972 several tangible results have been achieved. The following papers were published, viz.:

- Bulletin no. 3 - Community Water Supply Research 1972
- Bulletin no. 4 - The Story of CIPHERI
- Technical Paper no. 2 - The suitability of iodine and iodine compounds as disinfectants for small water supplies and an Interim Report on the Relation of River Water Quality and Water Pollution Index. A further paper on the standardization of plastic pipe will be finished early 1973. Requests for information were handled concerning topics, such as: hardness of water in various countries; clams and their control; nitrate level in drinking water, etc.

A start was made with the evaluation of hypochlorinators, a revision of a paper on "Purification of Water on a small Scale" and a study of technologies of water supply appropriate for use in developing countries.

The development of a documentation storage and retrieval system was initiated.

In the reporting period four collaborating institutions were visited and 27 visitors were received at the Centre for periods ranging between 1 day and 6 weeks.

A paper was presented at the International Water Supply Congress in New York on "The Water Supply Situation in Developing Countries".

In 1973 the I.R.C. hopes to be able to enhance its activities and to increase ~~contacts between institutes and individuals working in the field of community water supply.~~

The staff of the I.R.C. wishes the readers of its Newsletter a happy and prosperous New Year.

News from I.R.C.

An expert meeting on the toxicity of uPVC pipes and coagulant aids, sponsored by WHO and organized by I.R.C. will be held from 8 - 12 February 1973, in The Hague, the Netherlands. Experts conversant with the subject will discuss studies in these fields carried out until now.

Federal Republic of Germany

DOCUMENTATION

The "Ordnungssystematik zur Dokumentation Wasser" which is published by the Deutsche Dokumentations Zentrale Wasser e.V. Düsseldorf, Erich Schmidt-Verlag, Bielefeld is a thesaurus in 3 languages (German, English and French) consisting of 2 volumes and 5000 technical terms, in which the German terms are provided with the corresponding decimal classification number.

The thesaurus is necessary in storing and retrieval work of information on water and is important for scientists engaged in research and development work.

India

THE STORY OF CIPHERI

In October 1970 an International Conference on Research and Development in Community Water Supply was held in Dubrovnik, Yugoslavia. This conference was sponsored by the Yugoslavia Federal Administration for International Technical Co-operation, the World Health Organization and the United States Department of Health, Education and Welfare. The purpose of the Conference was to explore ways in which educational and research organizations can contribute to the practical solution of water supply problems in their respective countries, and in particular to methods of overcoming the twin obstacles of inadequate finances and insufficient skilled staff. The group was representative of both developing and developed countries.

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During the Conference a proposal was made that the International Reference Centre would publish a case history of a country that was successful in the set-up of a research centre in the field of community water supply. Such a story was considered to be beneficial for Governments in exploring ways for the realization of a sound organization for research and development in community water supply. The Story of CIPHERI, published as bulletin no. 4 of the International Reference Centre for Community Water Supply describes the history of the Central Public Health Engineering Research Institute (Nehru Marg, Nagpur 10, India) from the very beginning.

Netherlands

MINISTERS CONFER ON RHINE POLLUTION

The Conference at Ministers level on the pollution of the river Rhine taking place in The Hague on 25 - 26 October 1972 has agreed on several actions to be undertaken as soon as parliaments' approval is obtained. Waste of the French salt mines which until now was dumped into the river should at the latest in 1975 be stored partly in an underground storage. The project will be for joint account of the various riparian countries of the Rhine river basin: Switzerland, Federal Republic of Germany, France, Netherlands and Luxemburg.

The International Commission for the Protection of the Rhine River against Pollution will draft a list of substances which should be prohibited for direct discharge into the river and another one listing substances which can be discharged under certain circumstances. As regards thermal pollution, it is agreed that power stations under construction should not raise the temperature of the Rhine more than 2 degrees Centigrade during the months of July and August. Future power plants should be equipped with closed cooling systems.

CONCENTRATION OF VIRUSES

In the Government Institute for Drinking Water Supply in The Hague, concentration of viruses from water was investigated by two different methods: a) using an insoluble polyelectrolyte PE60; b) using a soluble alginate filter.

Both methods give a high recovery percentage of Poliovirus I (Sabin) and Echo 7, namely 70 - 90 % for the alginate filter and 100 % for PE60.

Although conditions of virus absorption to and elution from PE60 and alginate filters are known, in the study the following was investigated:

- a) virus recovery at low input of less than 100 PFU per liter
- b) required elution time
- c) use of continuous Vero cells instead of primary monkey kidney cells.

Upper Volta

A cooperation has been agreed upon between the Inter-African Committee of Hydraulic Studies, Ouagadougou, Upper Volta and the Central Public Health Engineering Research Institute, Nagpur, India, for exchange of information and documentation. It was realized that African problems and conditions are very much alike as those existing in India and that research results obtained in India can frequently be applied under rural conditions of Africa without much trouble.

In this framework of operation the CIPHERI bulletin "Disinfection for small community water supplies" was published in French in the November 1971 issue of the Liaison Bulletin of the Inter African Committee of Hydraulic Studies.

U.S.S.R.

DRINKING WATER STANDARDS

In Newsletter No. 15 (March 1972) referring to an item related to the "International Standards for Drinking Water" 3rd ed., 1971 attention was drawn to the report of the WHO Expert Committee on Health Criteria for Water Supplies, a copy of which can be requested from I.R.C. The deliberations of the Committee ultimately led to the publication of the above mentioned standards. During the Committee's meeting in Geneva from 30 March to 5 April 1971, U.S.S.R. standards were provided, consisting of a comprehensive list of 294 chemicals with criterion of harmfulness (sanitary toxicological, general sanitary and organoleptic) and maximum permissible concentrations. The standards are listed in a document of the Ministry of Health of the U.S.S.R. entitled "Maximum Permissible Concentrations of Harmful Substances in the Water of Water Courses used for Hygienic and Domestic Purposes (approved by D. Loransky, Deputy Chief Sanitation of the U.S.S.R., on 28 April 1970, No. 847-70)".

Congresses

"Water for the Human Environment" is the theme of the First World Congress on Water Resources, sponsored by the International Water Resources Association, to be held in Chicago, Illinois, U.S.A., September 24-28, 1973.

The Congress is open to members as well as non-members. Papers are accepted on any subject related to international aspects of water resources as they affect the human environment. One-page abstract is due February 15, 1973.

For further information, please contact or write Dr. G.M. Karadi, Secretary General IWRA, Science Complex Building, University of Wisconsin-Milwaukee, Wisconsin 53201, U. S. A.



News from I.R.C.

INTERIM REPORT WATER QUALITY AND WATER POLLUTION INDEX

In August 1971 a questionnaire was sent to Water Authorities and Research institutions all over the world in order to gather river water quality data and to relate them with a Water Pollution Index.

In this study the Water Pollution Index depends on number of people living in the river drainage area, their Gross National Product per capita and the yearly average discharge of the stream.

Although the filled-in questionnaires originate mainly from Western Europe and the U.S.A., an interesting relationship could tentatively be proposed for the Water Pollution Index and the following parameters: chloride, fluoride, phosphate, nitrate, BOD₅, coliforms, iron.

To complete the study more quality data are needed on rivers in South America, Asia, Africa and Eastern Europe and data on micro-pollutants as pesticides and trace metals. Water authorities who have not yet returned their data are specially requested to contribute to this important study.

Australia

DESALINATION BY ION EXCHANGE

The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Division of Applied Chemistry, Melbourne reports successful operations on a pilot scale using a novel ion exchange technique in standard equipment to lower the salinity of brackish water containing up to 3000 p.p.m. of salt. In the process, called Sirotherm, which is being developed jointly by ICI Australia Ltd. and the CSIRO Division of Applied Chemistry, brackish water is passed through a resin column which absorbs the salt till the bed is saturated. Whereas most ion exchange resins are regenerated by acids or bases in this new process this is done by hot water.

Certain advantages can be pointed out in comparison to other desalination processes. Since no phase changes are involved, there is no need to recover latent heat, only little sensible heat is required. This, with the possibility to use a relatively small driving force, results in reduced energy costs. Furthermore the fact that salt is extracted from water, rather than water from salt, helps to reduce the capital costs required.

Israel

WATER QUALITY RESEARCH IN ISRAEL

At present over 90% of all available water resources is being tapped and utilized for the country's need of which 80% is for the agricultural sector. In view of the increasing demand, pollution control and quality maintenance of the limited resources is essential. A water reclamation project is in a pilot stage, in which city's waste water is purified, recharged through infiltration beds in a sand dune area, and stored in an aquifer for 3½ years before being pumped up for urban and industrial use. In the development of new water resources, research and development work is undertaken also in the areas of artificial rainmaking, brackish water desalination and sea water conversion.

The publication "Water Quality Research in Israel" a publication of the National Council for Research and Development, Jerusalem 1972, was especially prepared for the 6th International Conference on Water Pollution Research, which was held from 19 to 24 June 1972.

It reports research activities in the fields of water quality management, water pollution control and desalination being carried out by various governmental bodies, universities and other research organizations.

Netherlands

GEOHYDROLOGY OF RESERVOIRS

The above communication No. 72-1 of the Government Institute for Drinking Water Supply, The Hague, Netherlands, by Ir. G.A. Bruggeman (language: Dutch, English issue in preparation) presents an analytical treatment of geohydrological problems concerning reservoirs situated in or above aquifers, with or without horizontal semi-permeable layers. Formulas are given for the seepage from or towards the reservoirs and for the variation of the ground water levels as a consequence of changing levels in the reservoirs.

Stress has been laid upon two- and three-dimensional problems taking into account vertical components of the ground water velocity and anisotropy in two main directions of the aquifers. A solution is given of the partial differential equations by means of: 1) Conformal transformation, 2) Integral transformations: a. Laplace, b. Fourier (sine-, cosine-, finite and infinite transformations) c. Hankel.

U.S.A.

SYSTEMS ANALYSIS OF DUAL PURPOSE NUCLEAR POWER AND DESALTING PLANTS

The Institute for Systems Design and Optimization, Kansas State University, Manhattan, Kansas 60502 (U.S.A.), is investigating the optimal process design of a dual purpose plant for producing power and water. A nuclear reactor and steam turbine power generator for steam and power production is coupled with two water plants, a multi-stage flash plant and a reverse osmosis plant. The total system cost for producing given levels of power and water is minimized. Optimal designs are presented for several combinations of water and external power demands ranging from 25 m.g.d. to 150 m.g.d. and from 50 MWe to 200 MWe.

FINANCING OF URBAN WATER SUPPLY IN DEVELOPING COUNTRIES

The World Bank (IBRD) and its affiliate the International Development Association (IDA) have since making the first loan for a water supply system in 1961 held to the view that municipal water supply should be considered as a public utility and should be operated as a business in which revenues generated by sales of water and by other sources should cover all costs and provide a surplus for further expansion.

Mr. Harold R. Shipman in his address to the 9th International Water Supply Congress held in New York in September 1972, is of the opinion that although this may be difficult to apply, it will give the best chance that future expansion can be financed. All costs should be controlled and the rate kept as low as possible to permit low-income people to pay for the water they need.

A well engineered project taking local conditions into account and choosing the most economic alternative together with good operation, good financial policy and management should be helpful in reducing costs.

Congresses and Symposia

1. Society of Toxicology, New York 18-22 March 1973. Theme: Toxicology of Environmental Chemicals.
Information: Dr. Robert A. Scala, Medical Research Division, Esso Research and Engineering Co., Linden N.J. 07036, U.S.A.
2. Activated Carbon in Water Treatment, Reading, 3-6 April 1973.
Information: The Water Research Association, Medmenham, Marlow, Buckinghamshire SL7 2HD, England.
3. Environmental Exhibition: Milieu '73, Utrecht, 11-17 April 1973
Techniques and Equipment for the purification of air and water.
Information: Project Manager Koninklijke Nederlandse Jaarbeurs, Jaarbeursplein, Utrecht, Netherlands.
4. Second International Colloquium on Underground Waters and First Conference on the Planning of Surface and Underground Waters of a Region, Palermo, 28 April - 2 May 1973.
Information: Dr. Giuseppe Cavolina, ESA, Via Libertà 201 bis., 90143 Palermo (Sicily), Italy.
5. 93rd Annual Conference American Water Works Association, Las Vegas, Nevada, U.S.A., 13-18 May 1973. Theme: Better Water for People.
Information: Registration Manager AWWA, 2 Park Avenue, N.Y. 10016, U.S.A.



News from I.R.C.

IMPROVEMENT OF COMMUNITY WATER SUPPLY IN DEVELOPING COUNTRIES

Sponsored by the World Health Organization, a meeting of Directors of Collaborating Institutions will be convened by the WHO International Reference Centre for Community Water Supply in Bilthoven, Netherlands in the second week of April 1973. After review and evaluation of the work of IRC and its network of Collaborating Institutions, guidelines should be set up for effective strengthening the above network. An important output of the meeting will be the formulation of detailed proposals for research, development and training programmes which should lead to an improvement of community water supplies, primarily in developing countries. As the latter is a matter of importance to the whole world, the Manager of the International Reference Centre, 13 Parkweg, The Hague, the Netherlands, welcomes proposals of research, and suggestions on activities to be undertaken which should be subheaded in: a) Title of Project b) Project Agency c) Objectives of Project d) Description of work proposed e) Budgetary, manpower and time requirements.

Australia

EVAPORATION CONTROL IN WATER RESERVOIRS

A protecting monomolecular layer of cetylalcohol has been proved to reduce evaporation losses from open reservoirs. This finding may be valuable for countries with a warm climate and where water sources are not abundant, so that conservation of existing surface sources is important. Above layer however is very sensitive and will easily break by the influence of wind and wave action, leaving the water unprotected. The Rivers and Water Supply Commission of Victoria reports successful experiments in applying light floating polyethylene gauze on the watersurface, which holds above monomolecular layer so that evaporation losses can be restricted to 40 percent or less of normal values. The polyethylene gauze has an expected life time of 5 years. With the cost of cetylalcohol which has to be applied two to three times per month, this results in a cost of approximate US\$0.04/1000 gal of water saved.

Belgium

BELGIAN ENVIRONMENTAL RESEARCH INDEX

The Belgian Environmental Research Index is a biannual publication of the National Centre for Scientific and Technical Documentation, 4, Boulevard de l'Empereur, Brussels. It is a current awareness service which mainly includes articles published in Belgium or articles published by Belgian authors in foreign periodicals. Belgian patents, books, conferences, symposia and congresses are also cited, even when texts are not available.

Kenya

AGAR DIP-SLIDES FOR BACTERIAL COUNTS IN POLLUTED WATERS

D.D. Mara of the University of Nairobi, reported in the Volume 6, 1972 issue of Water Research on the use of agar dip-slides in Kenya to estimate to the nearest order of magnitude total and coliform counts in sewage and polluted rivers. These estimates agreed closely with the corresponding pour-plate counts in yeast extract agar and lactose teepol agar.

The dip-slide technique is simple and is found accurate enough for routine monitoring of effluent quality and river pollution; reliable counts can be obtained by persons with no previous experience in practical bacteriology; only a portable incubator is required.

United Kingdom

RURAL WATER INVESTMENT IN KENYA

Rural water supply improvement is viewed by the Kenya Government as an important component of a new broad development strategy which has a rural basis and emphasizes employment, availability of economic and social services as well as increased per capita income.

It was anticipated that rural water supplies would generate social benefits exceeding social costs, and a recent shift in emphasis from financial to economic criteria has helped to generate interest in rural water investments.

In his study "Rural Water Investment in Kenya - Impact and Economics of Community Water Supply" I.D. Carruthers of the School of Rural Economics and related studies, Wye College, University of London, reported his findings, that few of the potential

health and economic gains are being realized, due to the absence of complementary or "back-up" agricultural and health facilities, for which viable programmes should be selected. Suggestions for optimum distribution systems are made, and water rating should be reviewed in the light of rural water supply as a basic social service. Different concepts discussed are finally set in a systems analysis framework.

News from WHO

SANITATION IN NATURAL DISASTERS

In collaboration with the League of Red Cross Societies, WHO has prepared a Guide to Sanitation in Natural Disasters (Assar M. 1971, Guide to Sanitation in Natural Disasters, Geneva, WHO, 135 p. Price \$ 4,00) providing basic information on the principles of emergency sanitation and detailed instructions for health authorities and relief agencies. The provision of a safe and adequate supply of water in a disaster area is of prime importance. Ground water is less likely to be contaminated than surface water. A well should be at least 30 m from any potential source of contamination, and should be disinfected with strong chlorine solution, producing a concentration of 50-100 ppm in the well, which is then left to stand for 12 hours before being pumped out. The water may be used after the well is refilled and the residual chlorine has dropped below 1 ppm. Surface water should be used as a last resort in which the intake should be at a higher level than any tributary which may be contaminated. Canvas, rubber coated nylon and plastic containers can be used as an emergency storage. It is necessary to test the water for residual chlorine, coliform bacteria, pH and alkalinity, even if the tests have to be carried out under field conditions.

Conferences and Symposia

1. Hygienic toxicologic evaluation of substances in drinking water
28 - 29 March 1973, Berlin. Information: Institut für Wasser - Boden und Luft Hygiene des Bundesgesundheitsamts Corrensplatz 1, 1 - Berlin 33 Postfach.
Fed. Rep. of Germany.
2. A symposium on Disinfection of Water, 29th March 1973, Imperial College, London.
Information: Hon. Secretary, the Society for Water Treatment and Examination, 69 Disraeli Crescent, High Wycombe, Bucks., England.
3. Pollution, the challenge to Industry 17 - 18 April 1973, London.
Information: The Financial Times Ltd., Conference Dept., 388 Strand, London WC 2R OLT
4. National Meeting on Complete Water Reuse (AIChE - EPA), 22-26 April, Washington D.C.
Sessions will cover legislation and executive action, legal problems, case histories, industry - agriculture collaboration.
Information: AIChE, 345 E. 47th Street, New York N.Y. 10017, U.S.A.
5. Second Annual National Symposium on Societal Problems of Water Resources,
28 April 1973, Chicago, Illinois. Information: Dr. Musa Qutab, Chairman, National Symposium on Societal Problems of Water Resources, Bryn Mawr, St. Louis Av.
Chicago, Ill. 60625. U.S.A.
6. Austrian Water Management Conference 1973; 30 April 1973, Baden (near Vienna)
Theme: The Danube. Information: Oesterreichischer Wasserwirtschafts-Verband, An der Hülben 4/6, A - 1010 Wien, Austria.

Kenya

HARVESTING PRECIPITATION FOR COMMUNITY WATER SUPPLIES

In above essay, Mr. Brian Grover of the International Development Association, Washinton D.C., U.S.A., analyses the feasibility of a water supply for Manda Island, Kenya. Based on water demand and meteorological data a least cost solution proposal for supplying the community's demand for fresh water was the construction of precipitation harvesting schemes with asphalt catchment areas and butyl lined excavated reservoirs.

U.S.A.

DEVELOPING A HANDPUMP FOR DEVELOPING COUNTRIES

Under an Agency for International Development (A.I.D.) research contract, the Battelle Memorial Institute of Columbus, Ohio, has developed a hand operated water pump for manufacture and use in developing countries with features as: low production cost, minimum capital investment, long life under severe conditions, easy operation and simple maintenance. (Ref.: D. W. Frink and R. D. Fannon, Jr.: The development of a waterpump for underdeveloped countries, Battelle Memorial Institute, Columbus, Ohio, 43201) The simple piston design with adaptation for shallow and deep well operation and consisting of a minimum number of components should be flexible enough to adapt to the technical levels of countries with a small industrial base. A program is being worked out to manufacture the new pump in Thailand, Bangladesh and Nigeria. As soon as sufficient pumps have been produced locally, an inspection program will be started to determine their points of weakness and the repairs needed. Abstracting drinking water from a closed well with a handpump will certainly contribute to a more sanitary supply for people in rural areas until now depending from sources which are open to contamination.

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News from WHO

TWENTY-FIFTH WORLD HEALTH ASSEMBLY - COMMUNITY WATER SUPPLY

Targets for the Second United Nations Development Decade (1971-1980) indicate that all urban dwellers should have access to safe water either in their houses or from public standposts and that the percentage of rural population having reasonable access to safe water should be doubled by the end of the Decade.

New information from 90 developing countries necessitates the revision of some target components to arrive at the above objectives, namely 60% of all urban population to be served by house connection and 40% to be served by public standposts (previous targets were 40% and 60%); 25% of 1980 rural population to have reasonable access to safe water (previous target 20%).

This increase of the target components and higher per capita construction costs result in an overall estimate of required funds at US\$ 13,200 million, compared to the previous estimate of US\$ 9,100 million.

The twenty-fifth World Health Assembly which met in May 1972 endorsed the revised targets and recommended that Member States should adopt specific national targets for the Second Development Decade for both urban and rural water supplies and undertake the systematic collection of information. They should also provide for the effective surveillance of drinking-water quality and give priority to the hygienic collection and disposal of wastewater whenever community water supply programmes are instituted. WHO would give technical assistance to Member States and would prepare guidelines, manuals and codes of practice on the planning, design and management of community water supply and sanitation services.

Cooperation with international and bilateral bodies including development banks for increasing the assistance to national community water supply and wastewater disposal programmes should be fostered. (Resolution WHA25.35)

Publications of WHO International Reference Centre for Community Water Supply

- Annual Reports (latest for year 1972)
- Newsletter (28 issues distributed by April 1973)
- Information on Collaborating Institutions (1970)
- Technical Paper No. 1 : "Plastic Pipe in Drinking Water Distribution Practice: Introduction and Bibliography up to 1970" (1971)
- Technical Paper No. 2 : "The suitability of Iodine and Iodine compounds as disinfectants for small water supplies" (1972).
- Technical Paper No. 3 : "The Purification of Water on a Small Scale
- Technical Paper no. 3: "The Purification of Water on a Small Scale (revision of a paper originally published in the WHO Bulletin in 1956).

Congresses and Symposia

1. Groundwater Exploration and Development, 30 April - 4 May, 1973 London.
Information: The Administrative Assistant Short Course Unit, The Polytechnic of Central London, 35 Marylbone Road, London NW1 5LS.



News from IRC

RESEARCH PRIORITIES IN COMMUNITY WATER SUPPLY

In an international conference organized in Bilthoven, The Netherlands from 9 - 13 April 1973 by IRC and attended by directors of institutions collaborating with the Centre and representatives of international organizations working in the field of community water supply, priorities for the following studies directed to developing countries were agreed upon: slow sand filtration in drinking-water supply; transfer of relevant technology from industrialized to developing countries; and impact of community water supply on health and socio-economic life. Systematic training programmes in various aspects of community water supply were also considered priority needs. Health aspects of water reuse and health effects of trace elements were considered of prime importance for study for industrialized countries.

Priorities were formulated for a programme which can be executed within the framework of recommendations made by the U.N. Conference on the Human Environment in Stockholm in June 1972. That meeting had designated water supply, sewerage and waste disposal systems as priority areas for research and had recognized the IRC and its associated collaborating institutions as an appropriate vehicle for training, research, and information exchange in this priority area.

Another major objective of the Bilthoven meeting was to evaluate the work of the IRC and the network of CI's, and to suggest means for strengthening the system. With the anticipated extension with regional reference centres and additional CI's and means now being explored of supporting IRC with additional funds and staff members, an increased output of the network should be achieved.

Austria

TECHNOLOGY TRANSFER IN DEVELOPING COUNTRIES

In developing countries "more attention is given to investment in equipment and buildings, less to the training of workers and managers and least to the development of technical capacity and designs" according to the United Nations Industrial Development Organization's Executive Director while addressing the International Seminar on Technology Transfer in New Delhi in December 1972. He thereupon suggested that the order of priority be reversed, which would lead "to the gradual introduction of locally produced equipment instead of imported items and to the development and modification of technology that will be incorporated in the further expansion of the industry. These modifications require a highly efficient technological capacity, which must always be on top of the problems and not dragged behind them."

France

FRENCH RESEARCH IN DESALINATION

In the Arab States Symposium on Desalination in November 1971 in Cairo, M. Michel et al. reported on facilities of a sea-water test station in Toulon ranging from test loops to industrial pilot projects. The Commissariat à l'Energie Atomique (CEA) is studying various distillation processes with respect to thermodynamics, hydrodynamics and economics. Electrodialysis is being studied at various temperatures, while the study of freezing has been stopped.

TECHNO-ECONOMIC COMPARISON OF DESALTING PROCESSES

Messrs. A. Maurel and P. Vignet in the August/September 1972 issue of *Chimie et Industrie (Génie Chimique)* have compared the cost of procuring potable water from sea or brackish water for distillation, reverse osmosis and electrodialysis plants with outputs from 10 to 100.000 m³/day. Factors considered are energy consumption, capital investment and operating cost. Series production, material development, improved heat transfer and dual-purpose plants should contribute to cost-reduction.

United Kingdom

EFFLUENT AND WATER ADVISORY COMMITTEE

A new advisory group has been set up in the United Kingdom to ensure that industrial firms are aware of the help available on water and effluent problems. Eighteen United Kingdom research associations together with the Water Pollution Research Laboratory, the United Kingdom Atomic Energy Authority, the British Steel Corporation Laboratories and representatives of United Kingdom Government Departments have formed the Effluent and Water Advisory Committee (EWAC), sponsored by the Committee of Directors of Research Associations.

On application to EWAC industrial companies can speedily be put in touch with the appropriate organization or person to advise on a particular water or effluent problem. Some of these can undertake design of treatment plant or investigations on a contract basis.

The Water Research Association is a member of EWAC and provides the secretariat and full support in handling enquiries, preparing publications and organizing events.

U.S.A.

SIMPLE TEST FOR FREE CHLORINE

R. Bauer et al. describes in the November 1972 issue of the Journal of the American Water Works Association a simple strip test for the quantitative estimation of free chlorine in water. The test consists of a buffered mixture of syringaldazine and vanillinazine impregnated into a sheathed paper strip. It reacts with free chlorine, giving a violet colouration and does not react with bound chlorine such as chloramines. The o-tolidine test generally employed responds to both bound and free chlorine. The treated strip of paper and a colour chart offer the operator a rapid means of detecting free chlorine during field testing.

WHO

HEALTH HAZARDS OF THE HUMAN ENVIRONMENT

The principal aim of this WHO publication prepared by some 100 specialists in 15 countries is to state as clearly as possible what is and what is not known about environmental hazards to human health. While intended mainly for health authorities, it should also be of interest to others concerned with environmental problems. The publication of approx. 400 pages consists of four parts: the Community Environment; Chemical Contaminants and Physical Hazards; Surveillance and Monitoring; Public Health Principles and Practices of Intervention. (WHO 1972, US \$11.00).

Congresses and Symposia

1. XXVth Cebedeau-Becewa International Days 1973 on Water and Air Pollution, 21 - 25 May 1973, Liège - Ghent - Brussels.
Information: Cebedeau-Becewa, 2 Rue A.Stévert, 4000 Liège, Belgium.
2. Group Training Course in Water Works Engineering 1973, sponsored by the Overseas Technical Cooperation Agency of the Japanese Government, May 20 - August 19, 1973. For 12 participants from developing countries, travel expenses and stipends can be supplied by the agency.
Information: Japanese Embassy.
3. International Symposium on the Development of Water Resources Projects with Inadequate Data (UNESCO), June 4 - 9, 1973, Madrid, Spain.
Information: David R. Dawdy, U.S. Geological Survey Engineering Research Center, Colorado State Univ., Foothills Campus, Fort Collins, Colorado 80521, U.S.A.
4. Effluent and Water Treatment Exhibition and Convention, Environmental Pollution Control Exhibition, Pollution Control Congress International Pipeline Engineering Exhibition, Pipeline Engineering Convention, 5 - 8 June 1973, Earls Court, London.
Information: Brintex Exhibitions Ltd., 178-202 Great Portland Street, London W1N 6NH, England.
5. International Symposium on Remote Sensing of Water Resources sponsored by the American Water Resources Association in cooperation with the Canada Centre for Inland Waters, 11 - 14 June 1973, Burlington, Canada.
Information: Dr. Robert K. Lane, General Chairman, Head Physical Limnology Section, Canada Centre for Inland Waters, 867 Lakeshore Road, P.O. Box 5050, Burlington, Ontario, Canada.
6. The British Waterworks Association's Annual General Meeting, Exhibition and Conference, 18 - 22 June, 1973, Torquay, Devon.
Information: Mr. Russell Clark, The British Waterworks Association, 34, Park Street, London W1Y 43L, England.
7. 17th Congress and Exhibition of Chemical Equipment Achema 73, Frankfurt (Main), 20 - 27 June 1973.
Information: Dechema, Postbox 970146, D.6 Frankfurt (Main) 97, Federal Republic of Germany.



Ghana

THE INTRODUCTION OF CATCHMENT SYSTEMS FOR RURAL WATER SUPPLIES

Mr. R. Neil Parker of the Department of Agricultural Economics and Management, University of Reading, U.K. undertook a socio-economic study of a village in S.E. Ghana during 1970 and 1971. Water consumption patterns have been measured and catchment systems suggested including corrugated tin roofs for catchment areas and concrete tanks for storage. Calculations are made of the time that is saved with such systems by the women who normally fetch the water from a seasonally flowing stream, half a mile away. The time saved is linked with its value to produce benefit/cost ratios, which can be used to compare investment in water catchment with that in other projects. Small improvements to the individual household's water supply are found to give benefit/cost ratios of up to 3.0 when 100% of the time saved is used for directly productive work or up to 1.7 when 57% of its is utilized. Constructing a community water supply which provides a regular amount of water throughout the year gives a benefit/cost ratio of 2.3 (at 100% utilization) or 1.3 (at 57%). Higher ratios can be achieved using communal systems, which satisfy only a proportion of the needs and do not attempt to furnish a regular supply; smaller tanks can then be used; in addition large roof areas of schools can be utilized to reduce construction costs.

India

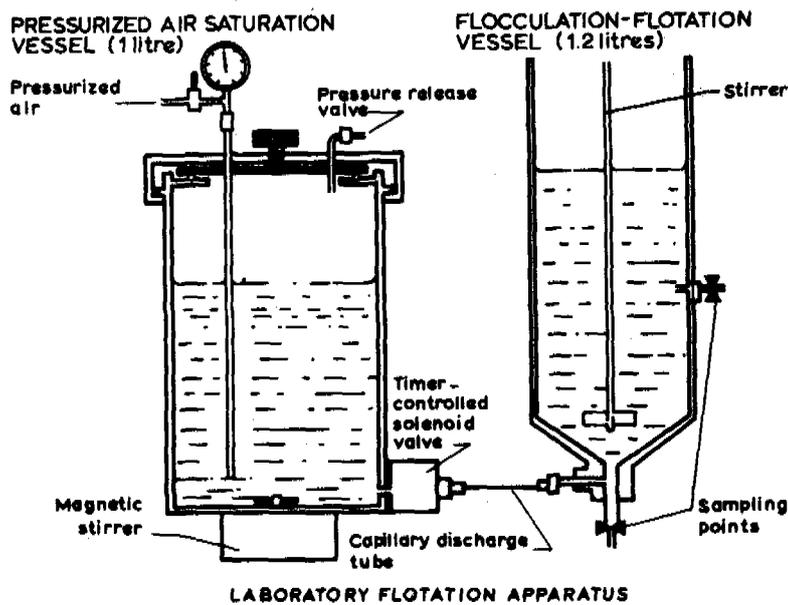
LEAKAGE DETECTION AND BACTERIOLOGICAL QUALITY

When an outbreak of infectious hepatitis typhoid and gastroenteritis occurred in early 1972 in the City of Aurangabad, the Government of Maharashtra invited the Central Public Health Engineering Research Institute (CPHERI) to investigate and scientifically assess the possibility of pollution existing in the water supply system which could have a bearing on the outbreak of these diseases, that can be transmitted through water. The survey brought out the following conclusions: Some 20 percent of the water meant for the consumers was going to waste through leakages. In spite of a sufficient chlorine dose, residual chlorine was not found at several points in the distribution system during the start of the supply, indicating an ingress of local pollution during non-supply hours which exerts a heavy chlorine demand. Bacteriological survey revealed high counts of coliforms and fecal coliforms in tap waters during the initial period of supply in the morning. Random fact-finding data on the incidence of diseases such as infectious hepatitis and enteric fevers in the pilot zone corroborated the statistics of incidence collected by the State Health Department earlier. Prevention of waste through leakage in the pipes should have not only economic but public health benefits as well.

United Kingdom

FEASIBILITY OF FLOATING WATER TREATMENT FLOC

Recent experiments at the Water Research Association have shown that it is technically feasible to use flotation instead of sedimentation to separate water clarification floc from treated water. A crucial point of the work was to determine whether flotation could proceed in the absence of additional chemical flotation aids (surface active agents); these would be highly undesirable in water for public supply. Batch tests were carried out on widely different types of water using specially-designed apparatus.



Summarized results

- Floc formed with iron and aluminium coagulants can be separated by flotation without the use of surface active agents.
- Efficient flotation was achieved by the addition of 5% by volume, or less, of water saturated with air at 340 kN/m^2 (50 lb/in^2).
- Flotation was considerably more rapid than sedimentation.

Details of the tests and the results are given in WRA TP 88 'Water Clarification by Flotation - 2'.

U.S.A.

DRINKING WATER FROM THE ANTARCTIC

An attractive possibility under study for providing Southern California with fresh water seems to be by floating icebergs from the Antarctic in 20 mile long "trains". About eight icebergs, each about two miles long and a mile wide, would be linked to a leading iceberg equipped with electrically driven propellers, drawing power from an escort ship. After being moved across the Pacific at a speed of one knot, the icebergs could be moored by being run aground about five miles offshore. Melted down they would yield pure water for domestic and other purposes. In addition to providing water, the icebergs would give Southern Californians year-round access to wintersports simply being adapted to skiing and skating.

Congresses, Symposia etc.

The Department of Environmental Sciences of the University of Virginia organizes a summer institute on water resources management to be held July 15 - August 15, 1973 at the Hebrew University, Jerusalem.

Topics of the course include water augmentation by precipitation enhancement and run-off management, ground water management, water conservation techniques, water in agriculture and water resources planning.

Information: Director, Summer Institute, Dept. of Environmental Sciences, University of Virginia, Charlottesville, Virginia 22903, U.S.A.

The scientific basis of filtration, NATO Advanced Study Institute at Churchill College, Cambridge, 2-20 July 1973.

Information: Prof. K.J. Ives, NATO Institute, Dept. of Civil and Municipal Engineering, University College, Gower Street, London WC1 6BT, England.

Environmental Health in the Americas, July 3-4, 1973, Mexico City, Mexico.

Sponsors: Consejo Nacional de Ciencia y Tecnología, Mexico and the American Association for Advancement of Science (U.S.A.)

4th International Symposium on Fresh Water from the Sea, Heidelberg, 9-14 September 1973.

Information: Dechema, 6 Frankfurt (Main) 97, Postfach 970146, Federal Republic of Germany.

Organized by the Working Party on Fresh Water from the Sea of the European Federation of Chemical Engineers in cooperation with Deutsche Gesellschaft für Chemisches Apparatewesen (Dechema), and the Institute of Chemical Engineers.

The Use of Mathematical Models in Water Pollution Control, a Symposium at the University of Newcastle-upon-Tyne, Claremont Road, Newcastle-upon-Tyne, NE1 7RU, England



United Kingdom

BACTERIAL INDICATORS OF FAECAL POLLUTION IN WATER SUPPLIES

Coliforms, E.coli and faecal streptococci are universally adopted for detection of faecal pollution, but none of these are ideal indicators in all environmental conditions. In warm (25 - 30°C) waters with a high organic content coliform and E.coli numbers frequently multiply, many of the "E.coli" isolates at 44°C are not E.coli type I, and the faecal streptococcus test is relatively insensitive. Research at the University of Newcastle upon Tyne, Department of Civil Engineering has established that Bifidobacterium (formerly Lactobacillus bifidus) should be considered as an alternative indicator organism. Field studies in the U.K., Kenya and Morocco have shown that the organism is specifically faecal, is present in raw sewage in higher numbers than E.coli, and does not multiply to the same extent as coliforms and E.coli in warm waters polluted with organic material.

Some of this work is reported in "A Comparison of the Distribution of Intestinal Bacteria in British and East African Water Sources", Evison, L.M. and James, A, (1973), J. Appl. Bact. 36.

U.S.A.

DESALTING

Based on a review of desalting literature and interviews with experts, the report by Mr. Victor A. Koelzer of the National Water Commission, 800 North Quincy Street, Arlington, Virginia, evaluates the state-of-the-art of desalting technology. It summarizes progress on desalting technology, describes applicability of distillation, crystallization, membrane and chemical processes. Water costs, economics of scale and other marketing factors are studied. Applications of desalting are considered for incremental supply, for improvement of the quality of supply, in intermittent operations in dual-purpose plants, and for water renovation, for reuse and agricultural purposes. The report concludes that desalting is presently a technically feasible source of new water for special situations. Research recommendations are included.

WHO

REUSE OF EFFLUENTS - METHODS OF WASTEWATER TREATMENT AND HEALTH SAFEGUARDS
(WHO Techn. Rep. Series no. 517, Geneva, 1973)

While the total amount of water available for use remains the same, the world's population is growing rapidly and urbanization and industrialization are causing increasing pollution of water sources. Thus potential sources of drinking water are becoming scarce. A WHO Meeting of Experts on the Reuse of Effluents was convened in Geneva in December 1971 to review and evaluate the reuse of wastewater and the health hazards involved.

The Meeting considered that as a general principle, water uses should be graded according to the degree of purity required, and, in any area in which water is short or likely to become so, available water sources should be allocated in such a way that water of high quality is not used for a purpose that can tolerate a lesser degree of purity, thus effecting savings of first-class water for drinking and other domestic uses.

After suitable treatment, wastewater is being used safely for irrigation, watering, recreational purposes and in industry. Where reclamation and reuse of wastewater for drinking is inevitable, appropriate water quality standards should be formulated and rigidly enforced. Reuse systems should be designed carefully and operation entrusted to highly trained personnel. Laboratory facilities should be adequate to undertake the programme of monitoring and appropriate testing required and full

knowledge should be maintained of each source of supply so that adequate safeguards can be taken. Further research should be undertaken in areas where the present knowledge is known to be insufficient, including potential long-term health effects of trace materials and residues remaining after conventional water treatment; the improvement of methods of identifying, measuring and monitoring chemical and microbial pollutants; the development and improvement of treatment and separation processes; the practicability and cost of dual water systems for first and second class waters with a view to effective use of the resources.

Morocco

INTERNATIONAL CENTRE FOR SANITARY ENGINEERING, RABAT

Since 1970 the International Centre for Sanitary Engineering, jointly established by the Government of Morocco and the World Health Organization at the Ecole Mohammadia d'Ingénieurs, Rabat, has offered a two-semester course in sanitary engineering in the French language.

Complementary to the theoretical and laboratory courses offered at the Centre, a programme of visits to selected community water supply plants and waste disposal installations was again organized this year in the Netherlands and Switzerland.

Congresses and Symposia

1. 9th Sanitary Engineering Seminar for Central America and the Caribbean, Panama, 3 to 7 September 1973. Sponsored by the Inter American Association of Sanitary Engineering (AIDIS).
Information: Ing. Juan D. Medrano U., Presidente de PANALDIS, Apartado 3462, Panama 1, Panama.
2. One-day WRA Regional Meetings 1973, to be held at 11 centres in Great Britain in the period of 4 September - 24 October 1973.
Topics: (1) Problems of sanitation in water supply; (2) Rectification, uprating and design of water treatment plants.
Information: Member Services WRA, Ferry Lane, Medmenham, Marlow, Bucks. SL7 2HD, England.
3. Annual Conference and Exhibition, Institute of Water Pollution Control at Torquay, England, 10 - 14 September 1973.
Information: Mr. F. Stephens, General Secretary, The Institute of Water Pollution Control, Ledson House, 53 London Rd., Maidstone ME16 8JH, England
4. Short Course Environmental Health Engineering in hot climates and developing countries, Loughborough University of Technology, 17 - 22 September 1973.
Information: Mr. John Pickford, Department of Civil Engineering, University of Technology, Loughborough, Leics., LE11 3TU, England.
5. Symposium on the Development and Control of Water Resources, Haifa, Israel, 17 - 21 September 1973.
Information: Prof. N. Buras, Israel Committee for Automatic Control, Technion, Haifa, Israel.
6. Conference on Environmental Health Engineering in hot climates and developing countries, Loughborough University of Technology, 24 - 25 September 1973.
Information: Mr. John Pickford, Department of Civil Engineering, University of Technology, Loughborough, Leics. LE11 3TU, England.
7. Computer Uses in Water Systems, University of Reading, 25 - 27 September 1973.
Information: The Water Research Association, Ferry Lane, Medmenham, Marlow, Bucks. SL7 2HD, England.
8. Conference on Improvement in Planning of Water Management, Budapest, 25 - 27 September 1973.
Information: Hungarian Hydrological Society, 1372 Budapest, Kossuth tér 6-8, Hungary.

Announcement of congresses and symposia

Those who want to announce congresses and symposia or other events in the IRC-Newsletter, are requested to make the relevant information available to the Editor at least 4 months before the date of the event.



India

SOLAR STILLS FOR GOOD QUALITY WATER

The Central Salt and Marine Chemicals Research Institute at Bhavnagar has designed and fabricated a solar still for producing water of a good quality. Water to be distilled is placed in black bottom trays covered with inclined glass sheets to form an airtight enclosure. Solar energy heats the water and the vapours formed condense underneath the glass. The condensate flows into channels provided for this purpose. The Institute has installed ten stills with complete concrete construction having a total capacity of 1000 litres/day, which have functioned satisfactorily over a period of three years.

Solar stills developed do not require any major equipment except for a feeding pump. All the construction material like concrete pipes, channels, plastics and glass are available indigenously.

Netherlands

INDUCED RECHARGE

Within the framework of a master plan for drinking water supply in the Netherlands, the Government Institute for Water Supply is exploring the possibilities of induced recharge, i.e. the exploitation of groundwater at some distance from a river. The investigation aims at finding the relation between river pollution and ground water quality, as determined by the soil characteristics. The pattern of the flow field, the travel time, distribution and the influence of dispersion and absorption hereupon are part of this investigation, which has to lead to an optimum location of the means of recovery with respect to water quality.

In view of the extent of the subject, the work can be expected to take several years. As yet results are not available.

TRACE ELEMENTS AND HARDNESS OF DRINKING WATER IN RELATION TO CARDIOVASCULAR MORTALITY.

A literature study by Dr. F.J.J. Brinkmann, which appeared as Communications 73-2 of the Government Institute for Water Supply, 13 Parkweg, The Hague, disclosed that initially a relation between geographic location and cardiovascular and cerebrovascular mortality was observed, which could however not be explained.

In 1957 the "water factor" was introduced as a possible cause. There seemed to be a relation between pH of river water consumed and cerebrovascular mortality. In a later stage the relation of pH to mortality from heart diseases proved more obvious. This was even more the case if cardiovascular mortality was related to hardness of drinking water.

After extensive retrospective epidemiological investigations, frequently with contra-results, attention was centred on the concentration of trace elements in drinking water, especially of Cd, Pb, Mn, Cr, Cu, Li, Zn, Mo and Ni. There seem to be indications for an effect of these elements on cardiovascular mortality. Some epidemiologists are studying the involvement of trace elements in geochemistry, thus are approaching the problem in a more general way.

It is concluded that the water factor, with its trace elements, can hardly stand as the principal cause of cardiovascular mortality. For lead, cadmium and possibly antimony the trace element contribution by drinking water is not more than 20% of the daily intake; for the other elements it is less.

Switzerland

TECHNIQUES FOR REDUCING EVAPORATION FROM RESERVOIRS

The World Meteorological Organization, Case Postale 5, CH-1211 Geneva 20, Switzerland is conducting a survey on the "Status of Techniques for reducing Evaporation from Reservoirs" amongst WMO Member countries likely to have some contribution to make on this topic.

The results which will be published by WMO after completion of the study will be interesting especially for arid regions where loss by evaporation from sources of water supply is significant.

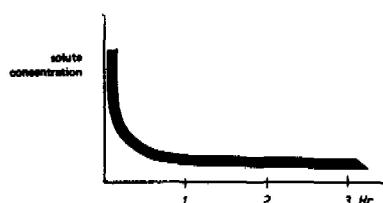
United Kingdom

POWDERED CARBON FOR ODOUR REMOVAL

Experiments to find out the effects of contact time, pH, addition of alum coagulant, presence of dissolved organic substances and water temperature on adsorption by powdered carbon conducted at the Water Research Association at Medmenham, Marlow, Buckinghamshire, SL7 2HD, England are described in WRA Technical Paper TP 93. In these experiments, the raw water was simulated by adding phenol or chlorphenols to distilled water. Some of the results are summarized below.

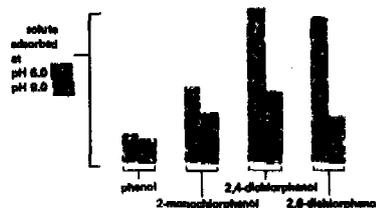
CONTACT TIME

In practice, contact times will generally be sufficient to use almost all the adsorptive capacity of the carbon.



pH

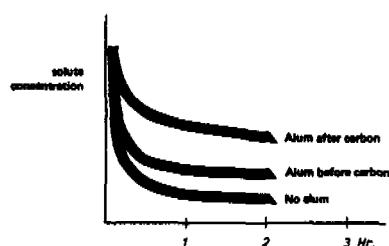
A change of pH from 6.0 to 8.0 reduced adsorption of phenol slightly, but greatly reduced adsorption of chlorphenols.



Thus the adsorption of phenol can be greatly improved by chlorinating before the water passes through the carbon.

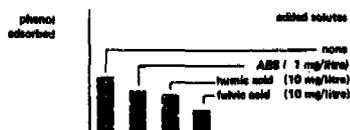
ALUM COAGULANT

Adsorption was reduced by the presence of alum floc on the carbon. The interference is reduced by adding the carbon at a late stage in the treatment.



DISSOLVED ORGANIC SUBSTANCES

Adsorption of phenol and chlorphenols was reduced in the presence of soluble organic substances such as humic substances and alkyl benzene sulphonates (ABS).



This effect could be minimized in practice by adding the carbon after coagulation and sedimentation.

Congresses and Symposia

1. First World Congress on Water Resources. Theme: Water for the Human Environment. Chicago, 24-28 September 1973
Information: Dr. G.M. Karadi, Secretary General, International Water Resources Association, Science Complex Building, University of Wisconsin, Milwaukee, Wisconsin 53201, U.S.A.
2. Sixth International Filtration and Separation Exhibition and Conference, Filtech 1973, London, 25-27 September 1973.
Information: Secretary Filtration Society, 1 Katharine Street, Croydon CR9 1BL, England.
3. International Symposium on Underground Waste Management and Artificial Recharge, New Orleans, 26-29 September 1973.
Information: Arnold I. Johnson, Office of Water Data Coordination, USGS, 2100 M. Street, N.W., Room 102, Washington D.C. 20242, U.S.A.
4. Envitec 73. Exhibition on environmental protection and techniques, Düsseldorf, 8-14 October 1973.
Information: Düsseldorf Messegelände mbH, NOWEA 2 - Messegelände, Postfach 10203 - D4-Düsseldorf 30, Federal Republic of Germany.
5. Ninth American Water Resources Conference, Seattle, 21-26 October 1973.
Information: Dr. Stanley P. Gessel, College of Forestry, University of Washington, Seattle, Washington 98105, U.S.A.
6. Symposium on Environmental Chemistry, technology and products in 1973-1978, Brussels, 24-25 October 1973.
Information: International Business Contact Club, Nieuwelaan 65-B-1820 Strombeek, Belgium.



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newsletter

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News from IRC

TOXICITY OF POLYELECTROLYTES IN DRINKING WATER SUPPLY

A Consultant Group convened by the WHO International Reference Centre for Community Water Supply to review health aspects of the use of polyelectrolytes in water treatment met in The Hague from 8 to 12 February 1973. In its report, the Group recommended inter alia that polyelectrolytes should be employed in the purification of water for public supply only after careful consideration of possible toxic hazards. Where possible, polyelectrolytes based on non-toxic materials should be employed. Synthetic polyelectrolytes should be used only if satisfactory control procedures can be established. Such control measures would involve the collaboration of health authorities at the national level to evaluate the toxic hazards of particular products.

The present use of polyacrylamide is based on limited toxicological data and more studies are required to establish an acceptable daily intake (ADI) for residues of monomer.

The report "Health aspects relating to the use of polyelectrolytes in water treatment for community water supply", published as Technical Paper Series no. 5, can be obtained on request from IRC, Parkweg 13, The Hague.

Ghana

GROUND WATER IN GHANA

The paper "Introduction to a map of underground water in Ghana", was submitted by Mr. R.R. Bannerman et al on the 8th Semi-Annual Conference of the West African Science Association held on March 20-23, 1972 and was referred to in the no. 12 February 1973 issue of the Bull. de Liaison du Comité Interafricain d'Etudes Hydrauliques (Communications of the Inter African Committee of Hydraulic Studies), Boite Postale 369, Ouagadougou, Haute Volta.

The paper introduces a map of well capacities in Ghana ranging from maxima of more than 18 cu m/h and less than 4 cu m/h. Most of the existing wells have a capacity range of 9 to 14 cu m/h.

The map should be very useful in planning a water supply from ground water. Current practice in Ghana reveals insufficient capacities obtained from many wells due to absence of hydrogeologic advice.

Great Britain

ANNUAL REPORT 1972 OF THE WATER RESEARCH ASSOCIATION

The Director of Research of the Water Research Association, Ferry Lane, Medmenham, Marlow, Bucks. SL7 2HD, reports in the Annual Report 1972 on studies of quality changes of water percolating through media in artificial recharge and when water is stored and algal growths occur; surveys are made of trace organics and metals in river systems. Existing processes are under continued exploration to improve performance and reduce costs and new techniques such as flotation, reverse osmosis and electro dialysis are investigated. Under study are problems relating to the preparation of potable water from raw water of poorer quality. In the distribution section, research is directed to improving both quality and quantity of distributed water. The application of operational research and other mathematical techniques to problems of cost efficiency has been given considerable attention, while services to members could be increased appreciably.

India

INDIAN LITERATURE IN ENVIRONMENTAL ENGINEERING

This Annual Bibliography 1971 is a review of Indian contribution in Environmental Engineering. It covers 810 references with titles and source of publication (journal, conference) grouped under the headings: water, waste water, solid waste, air pollution, industrial hygiene, rural sanitation, allied subjects, general works.

The bibliography is compiled by Central Public Health Engineering Research Institute, Nehru-Marg, Nagpur-440020, India.

PROCEEDINGS OF SYMPOSIUM ON ENVIRONMENTAL POLLUTION

Recently published by the Central Public Health Engineering Research Institute, Nehru-Marg, Nagpur-440020, India, are the Proceedings of the Symposium on Environmental Pollution, a joint event organized by the Indian Association for Water Pollution Control and CPHERI from 17-19 January 1973 at Nagpur. Research results were presented in the field of water pollution, industrial waste treatment, sewage treatment, water quality, water treatment, solid wastes, air pollution and other aspects.

Sweden

REINFILTRATION OF GROUND WATER

In the International Symposium on Ground Water Problems, Stockholm 1966, Mr. T. Agerstrand describes reinfiltration techniques in Sweden according to which the water table of iron, manganese and organic matter containing ground water is lowered in order to stop undesirable flux into an adjacent good source and prevent its deterioration. Aeration and filtration of the pumpage improve its quality which is then reinfiltrated to increase the supply of good quality waters.

Thailand

RESEARCH SUMMARY JANUARY 1973

In above publication of the Asian Institute of Technology, P.O. Box 2754, Bangkok, Thailand, the Institute's program of research is reported. Involvement in research in community water supply of the Environmental Engineering Division included the provision of a safe and adequate water supply to rural communities at a reasonable cost. The costs and benefits of providing community water supplies in Thailand are being analyzed with a view to improving the type and reliability of services and directing investment in the future. New techniques for treating surface water supplies using local materials are being investigated for their effectiveness, cost and simplicity of operation in rural areas.

U.S.A.

FLUORIDATION ENGINEERING MANUAL

Above manual by Ervin Bellack and published in 1972 by the Environmental Protection Agency, Office of Water Programs, Water Supply Programs Division, Washington, is intended to assist engineers in designing fluoridation installations and to water plant personnel to operate them. Topics discussed are: fluorine compounds used, feeding equipment, preparation of solutions, selecting the optimal fluoridation system, control and surveillance, maintenance, safety and hazards, technical problems. A list of 55 references is included.

Congresses and Symposia

1. Water, Berlin 1973 - Exhibition in conjunction with the German Industries Exhibition, Berlin 1973, October 30 - November 11, 1973.
Information: AMK Berlin, Ausstellungs Messe-Kongress GmbH, D 1000 Berlin 19, Messedamm 22.
2. Viruses in the Environment and their potential hazards, Burlington, Ontario, Canada, November 14, 1973.
Information: B.J. Dutka, Canada Centre for Inland Waters, P.O. Box 5050, Burlington, Ontario, Canada.
3. Short Course on Chlorination and Chlorinators, Bombay, 15-17 November 1973.
Information: CPHERI, Nehru-Marg, Nagpur-440020, India.
4. International Symposium on the Development of Groundwater Resources, November 26-29, 1973, Madras.
Information, Dr. V.C. Kulandiasswamy, Secretary International Symposium on Groundwater Resources, College of Engineering, Guindy, Madras-25, India.



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newsletter

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News from IRC

INTERNATIONAL NETWORK FOR COMMUNITY WATER SUPPLY

As of May 1973 the Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-440020, India (Director: Prof. N. Majumder) and the Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente (Pan American Center for Sanitary Engineering and Environmental Sciences - CEPIS) Avenida Salaverry 722, Casilla Postal 4337, Lima, Peru (Director: Mr. O.A. Sperandio) were designated as Regional Reference Centres for Community Water Supply providing important links in the WHO network for Reference Centres and Collaborating Institutions in association, communication and coordination among institutions in developing and industrialized countries in this field.

The Academy of Community Services, Moscow, U.S.S.R. (Director: Prof. F. Sevelev) was designated a Collaborating Institution for Community Water Supply in June 1973, bringing the total of Collaborating Institutions to 31.

India

JOINT EFFORT IN PUBLIC HEALTH ENGINEERING

A joint meeting of university professors in public health engineering and the staff of the Central Public Health Engineering Research Institute was held in Nagpur in June 1973 to seek ways of cooperation and develop an integrated approach to research and development work in public health engineering by universities, institutes of technology and national laboratories.

In view of the enormous task that lies ahead in this field and the limited resources and manpower available, such cooperation to achieve more efficient work and avoid duplications should be highly recommended for other countries as well.

STUDY OF HAND PUMPS

A WHO/UNICEF-assisted project for studying hand pumps for shallow tubewells was initiated at the All-India Institute of Hygiene and Public Health, 110 Chittaranjan Avenue, Calcutta-12, with a view to the development of a standard specification and design for the manufacture of hand pumps in the region. As a first part of the study several brands of commercially manufactured hand pumps were installed in the Rural Health Centre area of Singur, West Bengal and their performance was critically evaluated for a period of about 2 years. A final report on the findings of the study so far has been prepared. The findings show that there is lack of uniformity in the manufacture of these pumps and that there are several defects which lead to greater wear and tear and breakage of the component parts. The second part of the study, to standardize design incorporating the observations made and to manufacture prototypes of the standard design, testing the same in the field, will be started soon.

Japan

SEVERE DROUGHT IN JAPAN

The influence of extremely dry periods afflicting many parts of the world was also felt in Japan last summer. Total rainfall of only 30-60 percent of the past ten years' average value in the period of May to July, affected the drinking-water supply of 25 percent of the population, to avarious degrees. Tokyo had to cut its water distribution by 10 per cent, while two other cities were only served for 2-3 hours a day.

Peru

STUDY OF NATURAL COAGULANT AIDS

The Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS), Avenida Salaverry 722, Lima, is initiating a study of natural coagulant aids.

Substances to be studied in the first phase of the project are sodium alginate (derived from brown sea weed), potato starch and cassava (yuca) starch. Any information Collaborating Institutions can provide on these or other natural coagulant aids would be welcomed.

Upper Volta

STUDIES BY ICHS

Studies completed by the Interafrican Committee for Hydraulic Studies, B.P. 369, Ouagadougou, in the period March 1971 - March 1973 cover the following:

- "The choice of materials for piping to supply and distribute water", by Mr. Vaillant and Mr. Loussouarn.
- "Use of wind pumps to raise water", by Mr. Dupuis and Mr. Hlavek.
- "Comparative study of the respective advantages of wells and boreholes in West African regions with a crystalline substratum", by BURGEAP.
- "The possibilities for artificial rain in tropical Africa".
- "An attempt to adapt to African conditions the classic methods of calculating the output of urban sanitation works".

INTERAFRICAN COMMITTEE FOR HYDRAULIC STUDIES

The Comité Interafricain d'Etudes Hydrauliques, B.P. 369, Ouagadougou, aims to ensure a permanent exchange between member states of information pertaining to water, to carry out general studies of common interest, and to give technical aid to the states. At present 14 African states are members and two English-speaking states are associate members.

At its 7th Board Meeting held at Libreville, Gabon in April 1970 organizational activities and studies performed were reported. International interest was expressed in aid programmes by the French Aid and Cooperation Fund, the U.S. Agency for International Development, UNDP, UNESCO, and WHO. Study programmes adopted for 1973-1974 cover among other things the water supply to rural populations in Cameroun, Ghana and Madagascar; a study of a prototype hand pump adapted to African conditions; the treatment of water containing iron and manganese for water supplies to small communities.

U.S.A.

DEVELOPMENT IN WATER CLARIFICATION

An analysis by Mr. Graham Walton of the U.S. Department of Health, Education, and Welfare of "Developments in Water Clarification in the U.S.A." was presented at Symposium on Water Treatment in the Seventies, University of Reading, Reading, England, January 5-7, 1970.

In the U.S.A., the trend in water treatment is toward more effective control of coagulation to permit use of shortened settling time and higher rates of filtration. Such plants require conscientious operation to produce highly clarified water at near minimum cost. Good operation requires careful control over the dosages of chemicals used in coagulating the water and the proper operation of the filtration process. Empirical tests are still used for determining the proper chemical applications, but there is an increasing utilization of instrumental monitoring of the turbidity of the effluent from each filter to evaluate coagulation control.

Filter effluent turbidity is becoming accepted along with head loss as an indicator for termination of a filter run.

Congresses and Symosia

1. Short training course on domestic sanitary installations and their equipment, Lima, 22 October - 3 November 1973.
Information: Secretaria del Departamento Académico de Saneamiento UNI, Avenida Tupac Amaru s/w, Lima, Peru.
2. Water '73 - Third International Conference on Modern Technological Water Treatment Methods, Prague, 30 October - 2 November 1973.
Information: Dům techniky ČVTS, třída Míru 113, 532 27 Pardubice, Czechoslovakia.
3. IVth National Congress on Sanitary Engineering and Environmental Sciences, Lima, 4-10 November 1973.
Information: Andrés Ryes 532, San Isidro, Peru.
4. Seminar on Preventive Maintenance of Water Distribution Systems, Madras, December 1973.
Information: Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-440020, India.
5. Refresher Course on Environmental Microbiology, Nagpur, 17 - 29 December 1973.
Information: Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-440020, India.



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newsletter

No. 35 - November 1973

News from IRC

UPVC PIPES AND HEALTH ASPECTS

A consultant group convened by the WHO International Reference Centre for Community Water Supply with the financial support of WHO, met in The Hague in February 1973, to review current practice in the use of uPVC pipes with reference to toxic substances which may leach out into the drinking water. In its report, the group recommended that national standards for uPVC pipes limiting the amount of extractable toxic substances should be prepared.

The use of toxic ingredients required for production should be limited to the absolute minimum. Lead stabilized uPVC pipes tested according to ISO draft standards can be expected to leach lead in very small quantities. The lack of toxicological data in organo-tin compounds is noticed, while cadmium compounds should be excluded in formulations for uPVC drinking water pipes.

The report "Health aspects relating to the use of uPVC pipes for community water supply", published as Technical Paper Series No. 4, can be obtained on request from IRC, Parkweg 13, The Hague.

Brazil

NATIONAL COMMUNITY WATER SUPPLY PLAN

~~Brazil has entered on an extensive programme with the target of providing 80% of the total urban population with water supply by 1980.~~ A national revolving fund has been established for this purpose using social security funds. The financing of community water supply systems is secured on the basis of reasonable interest rates for a period of 21 years with three years of deferred payment (time of construction) without subsidies. At present 19 states (out of 21) are engaged in programmes and three of them have already constructed water supply systems in more than 80% of their towns. New technologies are being applied in order to reduce costs. In the field of water treatment a combination of upflow contact filter and downflow rapid sand filter has been developed. The latter showed appreciable cost reductions.

Great Britain

LABORATORY AND PORTABLE pH METERS

In the Water Research Association's Technical Paper TP98 on laboratory and portable pH-Meters, manufacturers' specifications and information on 94 meters, generally of British make, have been tabulated so that they can be compared on pH and mV range, scale length and division, accuracy, temperature compensation, features, supplies and cost. The report also summarizes criteria for selecting a suitable instrument.

POTABLE WATER BY SOLAR DISTILLATION

In his publication in the Proceedings Royal Society of Edinburgh (1972) 73, 133 - 144 on the provision of potable water by solar distillation, Mr. A. Porteous discusses principles, construction and performance of solar distillation plants. Reliability and fresh water costs are compared with those of conventional distillation processes and plants with capacities up to 38 m³ are competitive.

WATER RESEARCH CENTRE

With the Water Act 1973 becoming law, reorganization of the water industry will be put into effect on 1 April 1974. Accordingly a Centre for Research will be set up which is to absorb the Water Research Association, the Water Pollution Research

Laboratory, a part of the Technology Division of the Water Resources Board and a minor part of the Development Division of the Department of the Environment's Directorate General of Water Engineering.

With a total staff of around 450 the Centre will be an autonomous body, owned and controlled by its members.

India

STUDY ON SHALLOW TUBEWELLS WITH HAND-MADE STRAINERS

With a view to finding a solution to the problem of corrosion and choking of commercially available bimetallic strainers necessitating frequent resinking of tubewells in the Singur area, the All-India Institute of Hygiene and Public Health, 110 Chittaranjan Avenue, Calcutta-12, initiated research on the use of hand-made non-metallic strainers made of coconut coir, nylon wire wound round a perforated base pipe. Both metallic and non-metallic pipe (plastic pipe) have been used as base pipes. Strainers made by manually cutting vertical slots on plasticized PVC have also been tried. These strainers are installed in several tubewells ranging in depth from 30ft to 150ft for a period of 2-3 years and longer. The performance of these strainers is still under investigation. Preliminary observation so far indicates that hand-made strainers, which can be locally manufactured, are cheap and can serve the tubewell as satisfactorily as the factory-manufactured metallic cloth strainers. However, their effect on water quality is still under observation.

Jamaica

LOW-COST RAINFALL CATCHMENTS

As central and western Jamaica consists of lime-stone country, most rainfall is directly absorbed in the permeable soil and disappears to a considerable depth, and the prospects of exploiting groundwater by boreholes are slim.

A research project is being launched and executed by the Water Resources Division of the Ministry of Mining and Natural Resources to determine the feasibility of large low-cost rainfall catchments. The pilot scheme consists of a worked-out bauxite pit reshaped into a 660,000 gallon reservoir surrounded by a reformed area of 0,6 ha for construction of the catchment. The reservoir was sealed with 0,030 inch butyl rubber and different water-proofing materials are being tried out as cover for the catchment area: 0,015 inch aluminium sheets, 0,080 mm aluminium foil weighted with discarded tyres, and 0,010 inch black polythene sheet covered with limestone chips. The unit will supply 5000 gallons of water per day. Total cost amounts to \$45 per 1000 gal. of storage capacity which compared favourably with concrete (over \$200). With moderate capital cost and negligible running costs, improved rainfall catchment supplies may fill a need as an interim measure or as a supplement to conventional sources.

U.S.A.

VILLAGE TECHNOLOGY HANDBOOK

The Village Technology Handbook, published by VITA (Volunteers in Technical Assistance), 3706 Rhode Island Avenue, Mt. Rainier, Md. 20822, is intended to provide information on techniques and devices which can be used in villages.

This tried-out information, including 136 pages on Water Resources and 38 pages on Health and Sanitation, is compiled in this book and serves as information source for village workers active in assistance work in economic and social development, especially in rural areas.

Congresses and Symposia

1. The operation of treatment plants, a course sponsored by PAHO, CEPIS, Inter-american Development Bank, and the Ministry of Housing, Lima, Peru, 26 November - 22 December 1973.
Information: Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente (CEPIS), Avenida Salaverry 722, Lima, Peru.
2. Seventh Public Health Engineering Conference on Education and Training for Public Health Engineering and Environmental Management, Loughborough, 7-8 January 1974.
Information: Mr. John Pickford, University of Technology, Loughborough, Leics., England.



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newsletter

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News from IRC

RESEARCH PRIORITIES IN COMMUNITY WATER SUPPLY

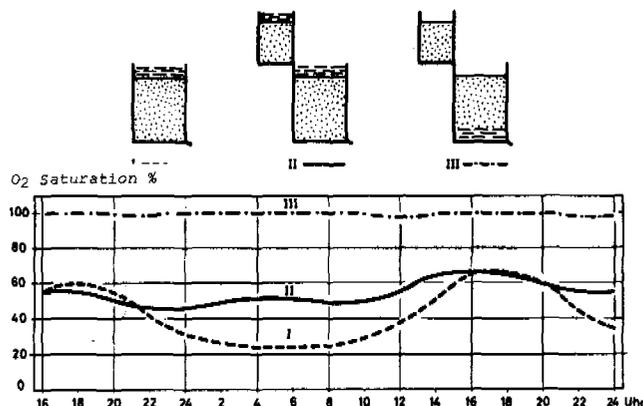
A news item under this heading was included in the IRC Newsletter of May 1973, referring to a "Meeting of Directors of Institutions Collaborating with the WHO International Reference Centre for Community Water Supply" that took place in Bilthoven, The Netherlands, in April 1973. A report on the proceedings is now available, and can be obtained on request from IRC, Parkweg 13, The Hague. It indicates areas on research and development, where benefits from project implementation would have the most immediate effect. Some projects would have direct impact in industrialized countries, while other projects are of greater importance to developing countries. The report also contains recommendations for an increased output of the international network of collaborating institutions in community water supply.

Federal Republic of Germany

VARIATION IN BIOLOGICAL FILTRATION

K.H. Schmidt reports in the general meeting of the Schweiz. Verein von Gas- und Wasserfachmännern, on 24 September, 1972 in Geneva, on an intermittent technique in slow sand filtration which has been applied for several years in Dortmund for preventing algal blooms. By using on-off operation on a 24-hours cycle, in which the filter is drained in the off-period, excessive algal growth was not encountered. Capacities could be raised from 400 to 1100-1200 m³/m² of filtered water per filtering cycle. Intensive aeration was also obtained by this technique.

In the intermittently operated pre-filter - slow filter system III almost 100% oxygen saturation is obtained in the effluent, which should be compared to the day and night variation of a normal filter I and the leveling of minima obtained by introducing a prefilter system II.



Oxygen contents in Slow Sand Filter effluents.

Kenya

LOW-COST BACTERIOLOGICAL EXAMINATION

D.D. Mara of the University of Nairobi, P.O. Box 30197, Nairobi, describes in Water Research, vol. 7, p. 1243-1245, 1973, equipment required to provide a small laboratory in up-country areas in developing countries with facilities for five coliform examinations (at 37°C) per day by the five tube 10 ml MPN method described.

The choice of method was based on acceptance of a slightly greater margin of error in the results in order to achieve experimental simplicity and minimization of costs.

United Kingdom

CATIONIC POLYELECTROLYTES AS PRIMARY COAGULANTS

Twenty-four proprietary cationic polyelectrolytes have been investigated as to their ability to flocculate clay turbidity and precipitate fulvic acid, which is the main component in coloured water, and prove their potentiality to replace conventional iron and aluminium salts for chemical water treatment. Almost all

polyelectrolytes were very poor coagulants when used alone but they can be made to work effectively if fine clay is added beforehand. Only half of the polyelectrolytes tested were capable of effectively precipitating dissolved organic colour. Under some circumstances the use of a cationic polyelectrolyte as a primary coagulant could result in savings. Further assessment in pilot scale plants would be necessary.

The above laboratory investigations by the Water Research Association, Medmenham, Marlow, Bucks. SL7 2HD, England, are reported in WRA Technical Paper TP100.

U.S.A.

VIRUSES IN WASTE, RENOVATED, AND OTHER WATERS

Edited by Gerald Berg, above publication EPA-6700-73-03 of the U.S. Environmental Protection Agency, Office of Research and Monitoring, National Environmental Research Center, Cincinnati, Ohio, gives literature abstracts of publications on the topic mentioned, during 1972.

Yugoslavia

ELIMINATION OF ALGAE

In the Sanitary Engineering Laboratory of the Civil Engineering Faculty Beograd, an introductory study was performed on the conditions of the elimination of various species of algae in water treatment by coagulation, flocculation and sedimentation. Pure cultures of the algae *Scenedesmus quadricauda* and *Oscillatoria formosa* were used, the optimum alum dosage being determined by zero zeta potential and the percentage of algae removed.

News from WHO

A WHO EXPERT COMMITTEE ON WASTES DISPOSAL (DISPOSAL OF COMMUNITY WASTEWATER) MET IN GENEVA FROM 25 SEPTEMBER TO 1 OCTOBER 1973.

It may be explained here that a WHO expert committee is a committee established to deal with a particular subject and consists of a group of experts convened for the purpose by the Director-General of WHO on the basis of their special knowledge and experience concerning the subjects on the agenda. The meetings are open only to those expressly invited to participate.

The Expert Committee on Wastes Disposal was attended by eight members. The International Association on Water Pollution Research, the International Bank for Reconstruction and Development, the United Nations Economic Commission for Europe, the United Nations Environmental Programme, and the WHO International Reference Centre for Wastes Disposal were also represented.

The purpose of the meeting was to recommend basic planning principles and appropriate standards of practice for the design of wastewater systems and their elements. The discussions were based on a study of the standards commonly used, and on specific reports of the experience of developing countries. A number of broad areas for the advancement and transfer of knowledge in this field were identified and recommendations made for action at national and international level. It is hoped that in due course the report will become available in the WHO Technical Report Series. Until then it is regretted that requests for copies of the report cannot be met.

Congresses and Symposia

1. Seventh Public Health Engineering Conference, Loughborough, 7-8 January 1974.
Theme: Education and Training for public health engineering and environmental management.
Information: Mr. John Pickford, University of Technology, Loughborough, Leics. LE1 3TU, Great Britain.
2. International Exposition and Seminar on Instruments and Systems for measuring and monitoring water quantity and quality.
Sponsor: International Water Resources Association, Chicago, Illinois, 25-27 February 1974.
Information: Brian J. Gallagher, Secretary U.S. National Committee IWRA, Pres. Limnetics Inc., 6132 West Fond du Lac Ave., Milwaukee, Wisc. 53218, U.S.A.
3. Symposium DVGW 1974.
Duisburg, 27-29 March 1974.
Theme: Drinking water protection zones; Water treatment processes.
Information: DVGW, Frankfurt a.Main, Postfach 970169, Federal Republic of Germany.



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No. 37 - January 1974.

Best wishes for 1974

The staff of the I.R.C. wishes a happy and prosperous New Year to all readers of the I.R.C. Newsletter

Australia

WATER TREATMENT FOR METROPOLITAN ADELAIDE

This report of the Engineering and Water Supply Department, South Australia, contains recommendations for improving the quality of the drinking water delivered to the city. The report found that Adelaide's water is no longer acceptable for a modern city. Studies of water quality records have confirmed that chemical and radiological levels of Adelaide's water supplies are satisfactory and that the hardness is tolerable. However, the physical characteristics of colour, turbidity, odour and taste fall far short from the established standards for public water supplies. Furthermore, while Adelaide's water may be judged to be relatively safe, it does not satisfy international standards for bacteriological quality and there is increasing concern that due to the presence of suspended matter some pathogenic organisms may be shielded from disinfection by chlorination. Based on laboratory and pilot studies and predictions of demand in the various zones of the water supply system, functional designs and estimates of cost have been prepared for the necessary seven treatment works to service the metropolitan area over the next 20 years. The estimated cost of the overall scheme with a total output of 330 million gallons per day will be A.\$35 million with a unit cost for the full water treatment of A\$0,08⁵ per 1000 gal.

Chile

WATER ANALYSIS

The University of Chile has developed a portable field kit for water analysis from locally available materials. A "Manual for Water Sampling" and a "Course on Health Chemistry and Bacteriology" have been published in Spanish by the same institute. Further queries should be addressed to Prof. Ana Maria Sancha F., Division de Ingenieria Sanitaria, Departamento de Ingenieria Civil, Universidad de Chile, Santiago.

Great Britain

RIVER POLLUTION IN GREAT BRITAIN

A Department of the Environment survey revealed that in 1970 there were 27,400 km of unpolluted rivers out of a total length of 35,900km surveyed. Some 5,290 km were classified as "doubtfull", 1,720km as "poor" and 1,530km as "grossly polluted". The main reason for the poor condition of some stretches of river was the dumping of industrial wastes by companies which felt that the maximum fine of £500 was a risk worth taking. A clean-up of the river pollution faces the drawback of a piecemeal system of authority over the various stretches of waterways. With 1,400 different local water and sewerage authorities uniformity of action has been difficult to obtain. In 1974 these will be replaced by 10 regional authorities. It has been estimated that the cost of bringing all the discharge of sewerage and industrial effluent up to the standards that are expected to be imposed by 1980 will cost about £600 million or £12 per person. Striking results have already been achieved in the Thames River by improvements in the treatment of London's sewage resulting in an increase in fish and bird life.

Peru

THEORY, DESIGN AND CONTROL OF WATER CLARIFICATION PROCESSES

The Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS), Lima has recently completed the printing of a book on "Theory, Design

and Control of Water Clarification Processes" in Spanish. The book is a comprehensive review of recent advances in water treatment, especially in coagulation, sedimentation and filtration processes. The application of new technology for the simplification of treatment system design and operation in developing countries is emphasized.

India

EXPERIMENTAL VILLAGE

The Indian Council of Scientific and Industrial Research has adopted a village in Karimnagar District, where the results of research and development activities of seven national laboratories will be put into practice so that the population may be directly benefit from them.

The environmental engineering aspects such as safe water supply and the provision of sanitary latrines are taken care of by the Central Public Health Engineering Research Institute, at Nagpur.

Sweden

REDOX POTENTIAL AND BACTERIAL INACTIVATION

K. Victorin et al found that in chlorine demand-free water, inactivation of Escherichia coli by sodium hypochlorite, monochloramine, dichloramine, halazone, chloramine T, cyanuric acid+ sodium hypochlorite and cyanuric acid monochloramine correlated better with redox potential than with the amount of available chlorine. For individual pure chlorine compounds, available chlorine generally correlated better with bacterial inactivation, than the redox potential. The findings were reported in the J. Hyg. Camb., 70 (6) 313ij323 (1972)

U.S.A.

INFECTIOUS HEPATITIS OUTBREAK

R.A. Garibaldi et al reports in HSMHA Health Rep. 87 (2), 164-171 (1972) on an infectious hepatitis outbreak in Polk County, Arkansas, in summer 1970. Of the 95 patients, about 80% had patronized a cafe in Hotfield, Arkansas, during a period of 3½ months.. Of a group of 470 area residents who had not been ill, only 19% had patronized the same cafe. Epidemiological and laboratory evidence incriminated cafe water as the most likely source of the epidemic. Of 78 hepatitis patients who had patronized the cafe, 97% had drunk water as compared with 55% of 53 non-ill patrons questioned. Although sanitary conditions inside the cafe appeared to be excellent, the tap water was contaminated with coliform bacteria. Fluorescein dye flushed down the toilet in the cafe appeared in the tap water 20 days later. Lateral seepage of effluent from a septic tank through underground shale fissures appeared to be the most likely route in contamination of the cafe water. Household contacts were treated with immune serum globulin and an immunization campaign for area residents was carried out to reduce the extent and severity of secondary spread.

Symposia and congresses

1. 27th International days 1974, Liège, Ghent, 6-9 May, 1974
Subject: among other things: specific water treatment methods, water problems in food industry.
Information: Cebedeau, Rue A. Stévert, 2B-4000 Liège, Belgium.
2. Drinking water distribution techniques, Noordwijkerhout, 10-12 June, 1974.
Sponsors: Water Research Association and Testing and Research Institute of the Netherlands Waterundertakings KIWA Ltd.
Information: KIWA, P.O. Box 70, Rijkswijk 2109, The Netherlands.
3. Tenth International Water Supply Congress, Brighton, 19-22 August, 1974.
Information: Secretary General, International Water Supply Association, 104A Park Street, London W1, England.



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SPANISH VERSION OF IRC NEWSLETTER

The Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS), Casilla Postal 4337, Lima, Peru, has completed the Spanish translation of the 1973 issues of the Newsletter and has begun distributing the Spanish version throughout Latin America. In 1974 the Newsletter will be translated and distributed monthly.

Federal Republic of Germany

MICROBIAL PRECIPITATION OF IRON AND MANGANESE

U. Hässelbarth and D. Lüdemann of the Institute of Water, Soil and Air Hygiene, Berlin-Dahlem, report in Water Treatment and Examination, Vol. 22, 62 - 77 (1973) on the removal of iron and manganese from groundwater by microorganisms.

Iron bacteria were found to be present in nearly all groundwaters. For conversion of divalent iron into trivalent hydrated oxides, flowrate, concentration and redox potential are important parameters in which the latter can be adjusted by addition of air. Direct preparation of bacterial cultures for removal of manganese will succeed if the water contains preferably more divalent manganese as divalent iron. Studies on a pilot scale reveal that iron and manganese removal show characteristics of deep bed filtration. At a flow rate of 10 m/h with 3-8 mm sand on a filter bed of 1,2 m iron contents were reduced from 17 ppm to 1 ppm.

Experiments with double layer filters are reported and schemes for bacterial removal of iron and manganese are included.

Peru

EVALUATION OF WATER SUPPLY AND SEWERAGE PROGRAMS IN LATIN AMERICA AND THE CARIBBEAN

The above document summarizing the progress made and mentioning constraints encountered in water supply and sewerage programs in Latin-America and the Caribbean in the period 1961-1971 is available in Spanish from the Pan American Center for Sanitary Engineering and Environmental Sciences, Casilla Postal 4337, Lima, Peru.

New goals adopted by the IIIrd Special Meeting of Ministers of Health in 1972, include:

- a. Urban water supply: 80% of population served by house connection, or a minimum 50% reduction in the population without this service;
- b. Maintenance and improvement of urban water supply systems to ensure uninterrupted service, sufficient quantity and high-quality water;
- c. Rural water supply: 50% of population served, or a minimum 30% reduction in the population without this service;
- d. Urban sewerage: 70% of population served, or a minimum 30% reduction in the population without this service;
- e. Rural sewerage or other method of excreta disposal: 50% of the population served, or a minimum 30% reduction in the population without this service.

The following strategy is suggested for the decade 1971-1980:

- a. Improvement of reporting systems for information on water supply and sewerage programs;
- b. Formulation of national and regional development plans which specify environmental goals and progress indicators;
- c. Strengthening of institutional infrastructure at the national level;
- d. Development of manpower resources through special training activities;
- e. Preparation of detailed pre-investment studies;
- f. Establishment of standards and quality controls;
- g. Development and/or adaptation of low-cost technology and administrative

- methods;
- h. Application of mass approach techniques and community self-help concepts in rural water supply programs;
 - i. Use of revolving loan funds to finance rural water supply programs;
 - j. Development of new methods of wastes management for rural communities and marginal urban settlements.

Thailand

FILTRATION STUDIES IN BANGKOK

An investigation was conducted to obtain design and operational information of the future Bang Khen Filter Plant of the Bangkok Metropolitan Waterworks. Four anthracite coal-sand dual media filters were studied by utilizing the coagulated and settled water from the existing Sam Sen Waterworks as influent water for filtration. These were tested at two filtration rates (12,7 and 20,0 m³/m²/hr) over a wide range of influent turbidity conditions. The addition of anionic polyelectrolyte to improve filtration efficiency was evaluated over dosage levels of 0,05 to 0,2 mg/litre.

Pescod, M.B. and Karot, T. (1973) Anthracite-Sand Filtration Studies at the Sam Sen Waterworks of the Bangkok Metropolitan Waterworks Authority, AIT Research Report, Bangkok.

United Kingdom

EWAC DIRECTORY OF SERVICES

The Effluent and Water Advisory Committee (EWAC), (see Newsletter no. 29) announces the publication of the EWAC Directory of Services, which catalogues the Committee Members' fund of expertise relating to effluent treatment and water utilization and directs enquirers to sources of expert advice.

Industry is becoming increasingly aware of the usefulness of an impartial body to advise on effluent treatment and disposal problems and on water reclamation. Many organizations are now having to consider treatment and disposal measures for their effluents, the economics of reclamation and re-use of process water and the measurement of effluent and water quality parameters.

The Directory is a comprehensive guide to sources of help in the reclamation and treatment of effluent and process waters.

The sections provide information on:

- The effect of pollutants on the aquatic environment and on the users of a water source
 - The statutory instruments controlling the quality of discharges
 - The industries, together with their main products, which may produce effluents and process water requiring treatment
 - The effluents themselves (listed by principal constituent) and the organizations giving advice
 - The organization and membership of the Effluent and Water Advisory Committee
- The EWAC Directory of Service is obtainable from the Technical Secretary, EWAC, Ferry Lane, Medmenham, Marlow, Buckinghamshire, SL7 2HD, or from any EWAC member.

Congresses and Symposia

1. The Control of Environmental Pollution, Salzburg, 28 April - 17 May, 1974.
Information: The Salzburg Seminar, Schloss Leopoldskron, Box 129, Salzburg, Austria.
2. The fight against pollution, Turin, 8 - 11 May, 1974.
Information: 1e Convegno Internazionale sul disinguinamento, Corso Massimo d'Azeglio 15, 10126 Torino, Italy.
3. Jubilee Congress Dutch Association of Water Engineers VWN.
Theme: The consumer and the public drinking water supply, Nijmegen, 15 - 17 May, 1974
Information: Secretary VWN, P.O. Box 70, Rijswijk 2109, The Netherlands.
4. Pro Agua - Pro Vita, Sixth International Exhibition for Environmental Sanitation, Basle, 11 - 15 June, 1974.
Information: Secretariate Pro-Agua - Pro Vita, P.O. Box, CH-4021, Basle, Switzerland
5. SEP/Pollution 74, International Exhibition of Public Services and of Techniques and Equipment against pollution, Padova, 18 - 22 June, 1974.
Information: Secretary SEP/Pollution, Via Tommaseo 59, I-35100, Padova, Italy.



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News from IRC

COMMUNITY WATER SUPPLY RESEARCH 1973

Under the above title, IRC bulletin No. 6 was issued giving information on research projects carried out in 1973, by 15 institutions collaborating with the IRC. This report is the third in the series on research projects in community water supply. In 1971 this bulletin series was started with the aim to promote a more extensive exchange of research methods and findings and a better coordination of research activities.

Copies of the Bulletin No. 6 can be obtained on request from the IRC, Parkweg 13, The Hague, The Netherlands.

Institutions which are working in the water supply field and wish to have their programmes included in the next bulletin are encouraged to provide the IRC with the information concerned.

Czechoslovakia

COMMUNITY WATER SUPPLY SURVEY

A community water supply study has been finished in the Czech Socialistic Republic (CSR), organized by the Ministry of Health, CSR, and the Institute of Hygiene and Epidemiology, Prague. About 1,5 million data collected by the Czech Public Health Service in more than 2,000 questionnaires were statistically treated, showing many aspects of the hygienic level of Czech community water supply in 1970. All systems supplying drinking water to more than 100 persons were included. At this time results are being used only for internal needs of the Czech Public Health Service. A summary of this study is planned to be published in the near future.

For further information please contact: Centre of General and Environmental Hygiene, Institute of Hygiene and Epidemiology, Srobarova 48, Prague-10.

Federal Republic of Germany

LEAD EXTRACTION OF DRINKING WATER

Th. Kempf of the Institute for Water, Soil and Air Hygiene, Berlin, reported at the International Symposium on Environmental Health Aspects of Lead held in Amsterdam, October 2-6, 1972 a significant increase of lead content in drinking water, which passes through lead pipes. In general the concentration of heavy metals can increase considerably when water comes into contact with containers, pipes and fittings during treatment, storage and distribution. Symptoms of poisoning have been observed in consumers living in a house with newly installed lead pipes. Even with older pipes, which have been used for decades, increased amounts of lead may be released when the supply is changed to softer water.

India

GROUND WATER SURVEY

Following the World Bank's 1970 report on the Indian economy, stressing the importance of improved water management, the Canadian International Development Agency offered a ground water research team to develop a data bank and water distribution map model which could be used as a model for other projects of similar nature in the country. The area selected for the ground water survey is a 3000 square-miles territory in hardrock areas of the Andhra Pradesh plateau west of the city of Hyderabad, where a complete evaluation of the existing and projected ground water resources will be made.

When the project is finalized in 1974, a pilot model will be obtained on which future projects of this kind can be based. On the basis of the information from the project, effective legislation can be enacted to protect available ground water resources.

Iran

POST-GRADUATE COURSES ON SURFACE AND GROUND WATER HYDROLOGY

Two new post-graduate courses on surface and ground water hydrology leading to a M.Sc. Degree in Engineering were developed at the Technical Faculty of the University of Tehran with cooperation of the Institute of Hydro-Sciences and Water Resources Technology, 64 Ghadessi Street, North Blvd. Elizabeth, Tehran, in September 1973. The major requirement for the candidates of these courses is that they should be University Graduates holding a B.Sc. Degree in Geology, Mathematics, Physics or Chemistry.

Netherlands

DRINKING WATER DISTRIBUTION TECHNIQUES

A conference on Drinking Water Distribution Techniques will be jointly organized by the Water Research Association and the Testing and Research Institute of the Netherlands Waterundertakings KIWA Ltd., on 10-12 June 1974, in Noordwijkerhout, The Netherlands. The aim is to present techniques which have been well tried in practice and those developed by the research organizations. Papers on Quantity Aspects, Quality Aspects, Materials and Equipment and Planning Aspects will be presented by staff members of WRA and KIWA and other specialists from European organizations in the field of water supply. Further information can be requested either from the Water Research Association, Ferry Lane, Medmenham, Marlow, Buckinghamshire SL7 2HD, England or from KIWA N.V., P.O. Box 70, Rijswijk 2109, The Netherlands.

U.S.A.

INTERNATIONAL EXPOSITION AND SEMINAR ON WATER RESOURCES INSTRUMENTATION

(Instruments and systems for measuring and monitoring water quantity and quality) Due to widespread interest in this International Water Resources Association sponsored Exposition and Seminar, the originally scheduled dates for February 25-27, 1974 have been postponed to June 4-6, 1974. The objective of this meeting, to be held in Chicago, Illinois, is to provide an international forum for the exchange of information on recent technological developments in the field of quantitative aspects of water resources.

For further information contact: Brian J. Gallagher, Secretary U.S. National Committee, IWRA, Linnetics Inc., 6132 West Fond du Lac Avenue, Milwaukee, Wisconsin 53218, U.S.A.

Reports received

1. Tenth Annual Report, September 1973, The Center for Research in Water Resources, The University of Texas at Austin, Route 4, Box 189, Austin, Texas, 78757, U.S.A.
2. Annual Report '72-'73, Water Resources Research Center, University of Hawaii, Honolulu, Hawaii 96822, U.S.A.
3. Civil Engineering Research, October 1971 - December 1972, Department of Civil and Municipal Engineering, University College, London, Gower Street, London W.C.1E 6BT, England
4. Publications of the Institute, October 1973, Water Resources Research Institute, Mississippi State University, Mississippi 39762, U.S.A.
5. Research Report, 1970-1973, City and Guilds College, Imperial College of Science and Technology, London, U.K.
6. Bibliography of scientific publications 1973 (in German), Institut für Wasser-Boden- und Lufthygiene des Bundesgesundheitsamtes, 1000 Berlin-33 (Dahlem), Corrensplatz 1, Germany.

For further information, please contact the respective institutes.



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Australia

REPORTS RECEIVED

R. Feachem, Domestic Water Use in the New Guinea Highlands: The Case of the Raiapu Enga, (Water Research Laboratory, The University of New South Wales, Manly Vale, N.S.W., Australia; Report no. 132, May 1973). The report describes and analyses traditional patterns of domestic water use in the New Guinea Highlands.

Bangladesh

WATER EXTRACTION FROM WELLS

Following a British Overseas Development Administration mission to Bangladesh to improve groundwater extraction, two research projects are being sponsored by the organization in England.

The Atomic Energy Research Establishments study in Harwell is aimed at developing improved well linings which will be cheap and easy to make and install and the possible use of local materials. The British Hydromechanics Research Association, Cranfield, Beds., is investigating the development of cheap and simple well pumps including the use of unconventional pumping techniques; the latter may lead to commercial manufacture of the selected pump.

India

TRAINING PROGRAM

Training courses are being organized in India which may be of interest also to people from adjoining countries. Representatives from African regions where conditions are similar to those prevailing in India can also take advantage of these courses. The program for 1974 includes the following topics:

January:	Leak Detection
February:	Air Pollution & Monitoring Techniques
March:	Sewage Treatment for Plant Operators
April:	Process Design in Waste Treatment
July/August:	Water & Waste Water Analysis
October/November:	Industrial Waste Treatment
November/December:	Plastic Plumbing
December:	Sewage Farming, City Refuse Disposal

Information can be obtained from the Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-440020, India.

Latin America

PUBLICATIONS IN SPANISH

Ing. Carlos E. Ruiz-Altuna, Analysis of residual chlorine by the Starch Iodine method, Universidad Nacional de Ingeniera Lima, Peru.
Ing. Oscar Cáceras-Lopez, Disinfection of water by chlorination, Ministry of Health, Lima, Peru.
Luis Alfonso Roa Venegas, Manual for Potable-Water Treatment Plant Operators, Institute of Special Health Programs, Bogota, Colombia.

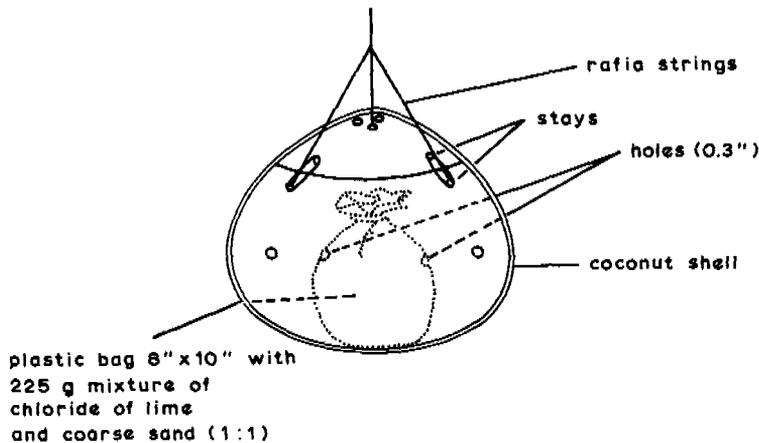
Malaysia

THE PAHANG COCONUT TYPE CHLORINATOR

Dr. Talib and coworkers of the Public Health Department, Pahang, Malaysia report experiments of well chlorination with a perforated plastic bag containing a 1:1 mixture of chloride of lime (bleaching powder) and coarse sand

which is lowered into the well in a coconut shell which is readily available in rural regions, as a container. In an open well containing 900 litres of

COCONUT TYPE CHLORINATOR



water with a withdrawal of ten percent of the contents per day, residual chlorine of 1.0 ppm at the start gradually dropped down to 0,1 ppm in 22 days. Longer periods were found in smaller wells. Since practically no supply in rural areas is treated, wide spread introduction of this inexpensive device, easily made from readily available material should be important to reduce and/or eliminate diseases which are spread by the use of unsafe drinking water.

Thailand

WATER CONSUMPTION IN SMALL COMMUNITIES OF NORTHEAST THAILAND

R.J. Frankel and P. Shouvanavirakul reported in Water Resources Research, 9, 1196-1207 (1973) on studies of water consumption in 14 rural communities of northeast Thailand to determine water needs and to delineate the factors that affect water use. For 13 of these communities, average daily water consumption ranged from 10 to 90 litres per capita per day. In one village with free water distributed through house connections 24 hr/day, water usage ranged from 115 to 160 l/cap/day. Water consumption was significantly influenced by the season of year, limited hours of availability of water through the distribution system, type of water service connection, and price of water for metered house connections only. Design criteria for maximum daily and maximum hourly water demands were found to be 1.5 and 4 times the average daily water consumption, respectively. The data collected reflect initial water use values in villages where water systems are only a few years old.

Congresses and Symposia

1. Annual Conference and annual general meeting of the Institution of Water Engineers, London, 15-17 May, 1974.
Information: Institution of Water Engineers, 6-8 Sackville St., London W1X 1DD, England.
2. 54th Congress of the Association Générale des Hygiénistes et Techniciens Municipaux, Chamoix, France, 27-31 May, 1974
Information: Association Générale des Hygiénistes et Techniciens Municipaux, 9 Rue de Phalsbourg, 75017 Paris, France
3. International Symposium on Recent Advances in the Assessment of Health Effects of Environmental Pollution, sponsored by the Commission of European Communities, the United States Environmental Protection Agency and the World Health Organization, Paris, 24-28 June, 1974.
Information: Secretariat of the Symposium Environment and Health, Health Protection Directorate, Commission of the European Communities, 29 Rue Aldringer, Luxembourg (Grand Duchy).
4. First World Congress of Environmental Medicine and Biology, Paris, 1-5 July, 1-5 July, 1974.
Information: Dr. Richard Abbou, 15 Rue de la Pompe, 75116 Paris, France.
5. XIV Inter American Congress of Sanitary Engineering, Mexico City, 4-10 August, 1974. Main subject: Inter American Program of Environmental Sanitation.
Information: Comite Organizador del XIV Congreso de la AIDIS, Alfonso Herrera Núm. 11-103, Mexico 4, D.F. Mexico.



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newsletter

No. 41 - May 1974

India

CPHERI DOCUMENTATION SERVICES

In order to try and keep scientists and researchers abreast with the latest information and help to accelerate research and development work, the Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-440020, India is providing the following documentation services:

1. Guide to Current Literature in Environmental Health Engineering and Sciences (current awareness of titles of articles in 250 journals).
2. Indian Literature in Environmental Engineering (annual bibliography).
3. Air Pollution Newsletter (highlights quarterly air pollution control activities in India).
4. Environmental Engineering - News Index.
5. Buyers' Guide to Water Supply and Waste Water Disposal: Equipment and Supplies.
6. Project-oriented bibliographies.
7. Recent additions (procured by the Institute).
8. Literature search and other services (requests from outside).

NATURAL COAGULANT AIDS

The Central Public Health Engineering Research Institute at Nagpur has developed several coagulant aids from natural products. Conclusions drawn from a four-year study of these products in a laboratory, pilot and plant scale indicate that they should be prepared fresh each time due to quality deterioration; the effective dose is in the 2 to 10 p.p.m. range at pH's between 2 to 9. Savings in alum consumption can be as high as 54% especially when highly turbid waters are to be treated.

Nigeria

RURAL WATER SUPPLY PROGRAMME

Under technical assistance arrangements, the Overseas Development Administration, Eland House, Stag Place, London SW1E 5DH, has engaged consultants to advise the Rivers State Utilities Board of Nigeria in supplying water to 40 rural communities. Having estimated future population and water demand, the consultants will outline water schemes for each community, including location and size of reservoirs, distribution mains, pumping stations and boreholes. The establishment of a water testing laboratory is also considered.

Peru

REFERENCE MANUAL - WATER METERS

This 603-page manual in Spanish provides information on basic aspects of the different types of water meters manufactured in the countries of the Americas and is intended to help water supply agencies to select the instrument best suited to their needs. The manual discusses theoretical aspects of water meters and describes the models available as of 1970. It contains over 250 photographs and diagrams.

Publisher: CEPIS (Centro Panamericano de Ingenieria Sanitaria y Ciencias del Ambiente, Avenida Salaverry 722, Lima, Peru.

United Kingdom

ENVIRONMENTAL HEALTH ENGINEERING IN HOT CLIMATES

A course on Environmental Health Engineering in hot climates and developing countries will be held at Loughborough University of Technology during the week of 22-28 September. Special emphasis will be given to: Water Supply Development; Low Cost Water Treatment and Sanitation; Operation of Sewage Treatment Plants in Hot Climates; Waste Stabilisation Ponds and Oxidation Ditches. Details may be obtained from: John Pickford, University of Technology, Loughborough, Leicestershire, LE11 3TU.

REMOVAL OF LEAD AND CADMIUM FROM WATER

The above publication describes a study undertaken by the Water Research Association, Medmenham, Marlow, Buckinghamshire SL7 2HD and which received financial support from the World Health Organization. Laboratory studies of lead and cadmium removal from raw waters containing 0.2 mg/litre of lead and 0.02 mg/litre of cadmium (i.e. twice the respective WHO limits for drinking water) were undertaken. It was found that these concentrations can be effectively reduced to below WHO limits by lime softening, coagulation preferably with an iron coagulant at high pH and by adsorption with bone char. In view of the effectiveness of bone char as an adsorbent for lead and cadmium, further work should be undertaken to determine the best method of applying this material in practice and its effectiveness in removing other toxic metals.

U.S.A.

WATER QUALITY TECHNOLOGY CONFERENCE

The first Water Quality Technology Conference was sponsored by the American Water Works Association and held in Cincinnati, Ohio, from 2-5 December, 1973. It was attended by over 500 professionals from various areas in water treatment. The emphasis was on the effect of a new federal water quality legislation (the Safe Drinking Water Act) and new drinking water standards on water treatment practice. This conference was oriented toward the technical aspects of water quality control rather than managerial aspects.

News from WHO

WORLD HEALTH STATISTICS REPORT

The findings of a WHO survey of community water supply conditions in 91 developing countries and of sewage disposal conditions in 61 developing countries as of 1970 have been published in the World Health Statistics Report, 1973, Vol. 26, no. 11. Copies may be obtained at a cost of \$5.25 from WHO Distribution and Sales Service, 1211-Geneva-27, Switzerland, or any of its sales agents.

Reports received

1. Annual Report 1972, National Institute of Public Health, Geitmyrsveien 75, Oslo, Norway.
2. Annual Report, Environmental Research in 1973;
3. Environmental Research Publications January 1971 - July 1973;
4. News of Environmental Research in Cincinnati, Publications 1973, National Environmental Research Center of the U.S. Environmental Protection Agency, Cincinnati, Ohio 45268, U.S.A.
5. Research Report 1972 - 1973, Department of Civil Engineering, The University of Newcastle upon Tyne, NE1 7RU, U.K.
6. CIPHERI Research in Retrospect 1959 - 1973, a bibliographical review, The Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-440020, India.

For further information, please contact the respective institutes.

Congresses and Symposia

1. International Conference on Viruses in Water, sponsored by the American Public Health Association, Mexico City, 9-12 June, 1974.
Information: Richard L. Wade Ph.D., Director of Program Services, The American Public Health Association, 1015-18th Street, N.W., Washington D.C. 20036, USA
2. Third International Plastics Pipes Symposium, Southampton, 10-12 September 1974.
Information: K. Bowden Esq., Blair Bowden Assoc. Ltd., 59 The Avenue, Southampton SO1 2TA, U.K.
3. "Five Countries, One Problem: our drinking water". 4th Working Conference of the International Working Committee of Water Supply Undertakings in the Rhine Catchment Area, Stuttgart, 16-18 October, 1974.
Information: Secretary of the "Internationaler Arbeitsgemeinschaft der Wasserwerke im Rheineinzugsgebiet", Condensatorweg 54, Amsterdam 1016, The Netherlands.



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No. 42 - June 1974

India

FLUORIDE REMOVAL BY MAGNESIA

While at low level fluoride in drinking water is beneficial to public health, higher levels are considered detrimental and in India the permissible concentration of fluoride is 1,0 mg/l.

Removal of excessive fluoride by absorption with magnesia was a subject of study at the Central Public Health Engineering Research Institute, Nagpur, India.

A typical ground water containing 10 mg/l fluoride, 60 mg/l hardness, 500 mg/l alkalinity and 7,5 pH when treated with 250, 500 and 1100 mg/l of magnesia, showed reduced fluoride values of 8.9, 8.4 and 5.8 mg/l. A dose of 1500 mg/l of magnesia and a contact time of 3 hours was needed to obtain the required 1 mg/l value which makes the method less attractive due to high cost and high pH of the resulting effluent, which necessitate subsequent acidification.

Information: Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-440020, India.

Turkey

SIMPLE WASTE TREATMENT METHODS

In the above publication S.J. Arceivala gives practical information on simpler methods of waste treatment like aerated lagoons, oxidation ditches and stabilisation ponds, which can reduce cost and complexity of treatment without sacrificing quality. A special effort has been made to include design criteria for small plants in warm and in temperate climates. The work was prepared to serve as a technical guide to practising engineers and students interested in the subject area. It was published by the Middle East Technical University, Ankara, Turkey and is available for US\$1.50 per copy, plus postage.

United Kingdom

W.R.A. DIGESTS

In order to serve a wider public the above digests, giving summaries of investigations made at the Water Research Centre (previous Water Research Association), Medmenham, Marlow, Buckinghamshire SL7 2HD, England, are now also published in German and French.

EXPERIENCES WITH UPFLOW FILTRATION

W.R.A. Digest 102 refers to investigations made at the Water Research Centre, Medmenham, Marlow, Buckinghamshire SL7 2HD, England, on the effect of filtration rate and media size on the performance of a pilot upflow filter. Different treatment schemes were investigated: terminal filtration following sedimentation as a single stage treatment, two-stage upflow downflow treatment. These led to the conclusion that the upflow filter has a high capacity for suspended solids, that it has considerable potential as the first stage in a two-stage system and that it is attractive for certain stored water treatment schemes.

U.S.A.

A CASE OF TYPHOID OUTBREAK

In February 1973 typhoid broke out at a migrant labor camp near Miami, Florida, which was said to be caused by deficient well-water system and sanitary conditions. The water supply was drawn from one 6-inch and one 8-inch well, the wells being driven to a depth of 20 feet and encased to the same depth. A manhole nearby had cracks through which surface water was infiltrating. Vitriified clay pipe from a sewer-line excavation site close to the well had been broken and portions removed. The sewage treatment facility discharged into a surrounding ditch, which was not connected to a moving body of water. Water lines were leaking and cross connections existed. Tracer dye tests showed the ease with which contamination of the surface of the ground surrounding the well house could reach the supply well.

WATER DATA INFORMATION

The 1972 edition of the "Catalog of Information on Water Data" of the U.S. Geological Survey gives information on 20,000 sites at which stream flow or stage is measured and 18,000 sites where water quality data are collected, including wells and springs. Each regional volume consists of three parts covering streamflow and stage; quality of surface water; quality of ground water. Copies are available from the Office of Water Data Coordination, U.S. Geological Survey, National Center, Mail Stop 417, Reston, Virginia 22092 (U.S.A.)

WATER POLLUTION BY AGRICULTURAL CHEMICALS

At the initiative of the EPA Southeast Environmental Research Laboratory, College Station Road, Athens, Georgia 30601, U.S.A., a project was started to develop a low-cost fertilizer that would release its constituents (nitrogen, phosphorus, potassium and sulfur) at a slow rate that would minimize water pollution by excess nutrients.

A 1500 pounds-per-hour pilot unit was constructed for production of a slow-release granular fertilizer using ammonium sulfate waste from coking plants as a feed stock. Test runs were successfully completed for various commercial mixed fertilizer grades. The fertilizer so produced is now ready to be tested for its agronomic properties and its coatability to enhance its slow-release properties.

PURIFICATION WITH BERMUDA GRASS

A joint study of the Agriculture Research Service, Arizona, Environmental Protection Agency and Salt River Irrigation District indicates that effluent from a sewage plant, which is loaded with ammonium compounds and coliform bacteria, is as pure as the ground water in any unpolluted formation after passing through basins lined with bermuda grass. The results of the study indicate that a 1000-acre of plant-soil filter will be required to process the sewage effluent of a city with a population of close to one million inhabitants.

GUIDELINES FOR SECTOR WORK IN WATER SUPPLY AND WASTE DISPOSAL

These guidelines suggest the means for acquiring the information about the water supply and waste disposal sector needed in order to prepare plans for its development. Sector studies are primarily for the benefit of decision makers at the national and local level, but they also benefit outside agencies interested in efficient development of the sector.

To be effective, sector work must involve both appropriate officials and the sector specialists in the country in question, and be seen as part of a continuous process for building up knowledge and improving decisions in the sector. Several typical sector issues are discussed, along with a number of practical considerations for organizing sector work. Detailed planning of sector work is emphasized. Annexes provide, among other things, checklists which help ensure that important aspects are not overlooked.

This IBRD publication should be of great interest to public works and water supply agencies and planning departments of governments, which can request a copy from the Public Utilities Department, International Bank for Reconstruction and Development, 1818 H. Street, N.W., Washington D.C. 20433, U.S.A.



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India

SEEDS OF RED SORRELA: A NATURAL COAGULANT

K.R. Bulusu and B.N. Pathak report in the Indian Journal of Environmental Health, 1974, 16, p. 63-67 on the excellent coagulating properties of the seeds of the Red Sorrel plant (*Hibiscus Sabdariffa*) when applied to turbid water. The plant is widely cultivated in India and the green seed pod is thrown away or used as cattle food. The dried seed when pulverised and mixed with sodium carbonate (9:1) can be stored without deterioration. Dispersed in water and heated, it gives a milky suspension which can be used as a coagulant. Experiments at high and low turbidities (7600, 3500, 315 and 86 units measured with the Hach turbidimeter) gave good removal of turbidity at lower dosages than required for alum. Coagulation finally was not effected by the presence of phosphates.

Lebanon

STUDY IN ENVIRONMENTAL ENGINEERING

A graduate program in Environmental Engineering was developed at the Civil Engineering Department, Faculty of Engineering and Architecture, American University of Beirut, Lebanon. The program leads to a Master's degree in Engineering with a major in Environmental Engineering. Typical research projects undertaken in the program include: water filtration by the use of floating media; use of local materials in water coagulation; removal of trace metals by algae. Details in the program can be requested from the Chairman, Civil Engineering Department at the above mentioned university.

Thailand

WATER QUALITY CRITERIA FOR TROPICAL DEVELOPING COUNTRIES

M.B. Pescod and M. Hanif suggest in above publication of the Asian Institute of Technology, Bangkok, that water quality criteria for tropical developing countries should be consistent with local environmental and economic conditions for optimal investment. Stream standards allow the assimilative capacity of a water resource to be used, which minimizes waste treatment costs; this is important for encouraging industrial development. The level of the standard should be based on an evaluation of resulting benefits associated with legitimate water uses and the costs of achieving the standard.

Levels of water quality criteria are suggested for major uses like potable water supply, irrigation and fishing, and a loose stream standard is recommended for waste disposal use. Technology of water quality management is reviewed and policy alternatives considered.

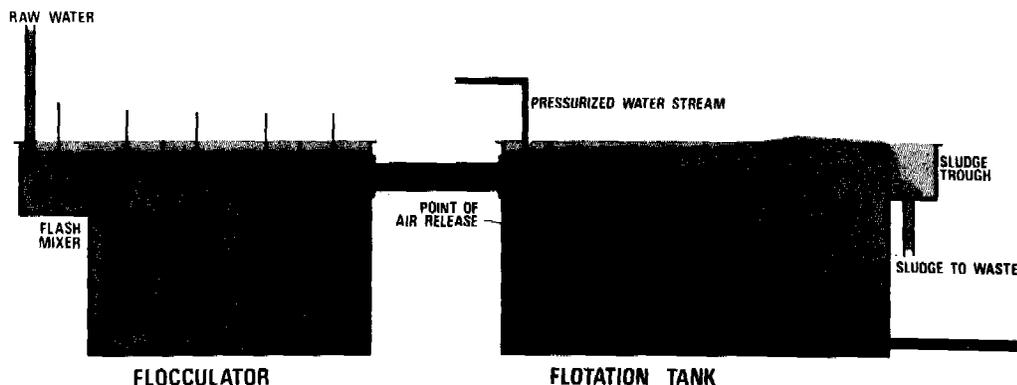
United Kingdom

WATER SUPPLY IN ENGLAND AND WALES

In Water Resources Board Publication No. 22, "Water Resources In England & Wales, Vol. 1 Report, Vol. 2 Appendices", London, HMSO, 1974 the water resources of England and Wales are examined and recommendations made how they may best be managed. The report is based on three regional reports: South East England (1966), North England (1970) and Wales and the Midlands (1971), and on a number of other studies and investigations. Preferred strategies are given for long-term and short-term (up to 1981).

WATER TREATMENT BY FLOTATION

Following successful laboratory studies (see our newsletter No. 30) according to which optimum chemical treatment for flotation was in general the same as for sedimentation, extended experiments were undertaken at a 0,002 m³/sec pilot flotation unit of the Water Research Centre, Medmenham Research Station, Ferry Lane, Medmenham, Marlow, Bucks. SL7 2HD. The process is as follows: Raw River Thames



water is dosed with a coagulant and flash-mixed for 1 minute. It then passes through a 4-stage flocculation process for 8 minutes before entering the flotation tank. Some of the filtered water then goes through a pressurised absorption column and enters the downflow section of the flotation tank through a special nozzle. (This contact is critical since this must be achieved without breaking up the floc). The air bubble/floc mixture thus formed rises rapidly to the surface and the clean water leaves the system after 6 minutes. A proportion of this is then fed to anthracite-sand filters.

During 1974 further studies will be undertaken using 0,03 m³/sec pilot plants at four waterworks, on a variety of waters including river waters of high and low turbidity, a soft upland water and waters subject to heavy algal growth, with technical assistance provided by the Water Research Centre.

U.S.A.

VIRUSES IN WATER

To a request for information on current investigations on viruses in water, replies have been received from institutes and organizations in Argentina, Australia, Brasil, Canada, Denmark, Federal Republic of Germany, France, India, Israel, The Netherlands, South Africa, United Kingdom and U.S.A. This information has been compiled and edited by Norman A. Clarke of the Criteria Development Branch, Water Supply Research Laboratory, National Environmental Research Center, 4676 Columbia, Parkway, Cincinnati, Ohio 45268, U.S.A.

The publication, Volume 4: Public Health Aspects of Viruses in Water gives a brief survey of activities in this field in the above countries.

Reports received

1. Technical Publications list, November 1973 of the Water Research Centre, Medmenham Research Station, Ferry Lane, Medmenham, Marlow, Bucks SL7 2HD, England
2. WRC Information, Publications & Meetings published by the Water Research Centre, Stevenage Research Station, Elder Way, Stevenage, Herts, SG1 1TH, England.

Congresses and Symposia

1. Soil, Water and Air analyses with environmental control aspects. Prague, 9-12 September 1974. Information: Dom techniky SUTS, Ing. N. Bajova 011 80 Zilina-Hliny, CSSR.
2. Seventh Conference of the International Association on Water Pollution Research. Paris, 9-13 September 1974. Information: SOCFI, 7 rue Michel Ange, F-75016, Paris, France.
3. Third International Exhibition Man, Air, Water, Noise and Solid Wastes. Paris, 9-13 September 1974. Information: Techno expo 8 rue de la Michodière F 75002 Paris, France.
4. 47th Annual Convention Water Pollution Control Federation. Denver, Colorado, 6-11 October 1974. Information: Water Pollution Control Federation 3900 Wisconsin Avenue, N.W. Washington, D.C. 20016.



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newsletter

No. 44 - August 1974

Colombia

RIVER POLLUTION CONTROL IN COLOMBIA

The Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS), Casilla 4337, Lima, Peru, is collaborating with governmental agencies in Colombia carrying out prefeasibility studies for water quality management of rivers which serve as sources of water supply and as receiving waters for the sewage of the three major urban centers of Bogotá, Cali and Medellín, comprising a total population in excess of 5 million inhabitants. For each of these studies CEPIS is providing technical assistance in methodology planning and mathematical modelling, including hydrologic models, water quality models and socio-economic decision models for multiple-use river basins.

Czechoslovakia

INVESTIGATION OF PLANKTON AND SEDIMENT

The Institute of Hygiene and Epidemiology, Srobarova 48, 100 42 Prague 10 - Vinohrady has developed an echo sounder equipped with a low-power microscope for investigating sediment and plankton in drinking-water reservoirs. The equipment will be useful in surveying large areas of eutrophic reservoirs as well as for recording sediment thickness.

Israel

ALGAE FOR WATER PURIFICATION

A research project to develop economical methods of growing and harvesting algae as a by-product from wastewater treatment has been initiated by the Human Environmental Sciences Laboratory of the Hebrew University of Jerusalem. The primary objectives of the project are to produce a low-cost protein-rich food supplement for animal feed as well as a highly purified wastewater for reclamation purposes. In addition to the engineering optimization studies and the development of algae separation techniques, the project will include toxicological evaluation of the sewage-grown algae as well as chemical and toxicological studies as to the suitability of the reclaimed water for various re-use purposes.

Japan

NEW STANDARDS FOR MERCURY

In April of this year, the Minister of Health and Welfare decided to revise the Japanese drinking-water standard for mercury. According to the old standard, mercury should be absent when analysed by the dithizone method which has as a detection limit of 0,020 mg/l. The new standard specifies that total mercury shall be less than 0,001 mg/l as analysed by atomic absorption spectrophotometry. This is in agreement with the tentative limits given in the 3rd ed. of the International Standards for Drinking-Water published by WHO in 1971.

Netherlands

REUSE OF WASTE WATER FOR COMMUNITY WATER SUPPLY

Before reuse of wastewater can be considered for community water supply in the Netherlands, several aspects of the problem need further study. In Communication no. 73-8 of the Government Institute for Water Supply, 13 Parkweg, The Hague, a research programme was formulated by H. Hofman and B.C.J. Zoeteman according to which the following will be investigated:

- qualitative characteristics of wastewater
- possible health risks in using recycled wastewater
- cost aspects of different combinations of purification systems in comparison with long distance supply and desalination of brackish groundwater or seawater.

CONFERENCE ON DRINKING WATER DISTRIBUTION TECHNIQUES

This Conference, sponsored by the Testing and Research Institute of the Netherlands Waterundertakings (KIWA N.V.) and the Water Research Centre, England, was held from 10 to 12 June, 1974 at the Leeuwenhorst Congress Center, Noordwijkerhout, The Netherlands.

The conference was attended by more than 200 engineers representing water supply undertakings in the U.K., the Netherlands, Federal Republic of Germany, France, Belgium, Finland, Norway, Australia, including representatives from Zaire, Cyprus and Israel.

Many valuable papers were presented at the meeting, whose four main sessions centred on quantity aspects, quality aspects, materials and equipment (including plastic pipes for water supply and toxicological aspects of materials in water supply), and planning aspects.

The proceedings of the conference will not be published. Requests for information should be addressed to Testing and Research Institute of the Netherlands Waterundertakings KIWA Ltd., P.O. Box 70, Rijswijk 2109, The Netherlands, or to the Water Research Centre, Ferry Lane, Medmenham, Marlow, Bucks. SL7 2HD, England.

Peru

RESEARCH IN SANITARY ENGINEERING IN LATIN AMERICA

The proceedings of a Conference on Research in Sanitary Engineering in Latin America have been published as No. 15 of the Technical Series of the Department of Engineering and Environmental Sciences of the Pan American Health Organization. Attended by researchers from 11 Schools of Engineering, 2 Schools of Public Health, 2 research institutions located in 9 American countries, and with the participation of 14 consultants from PAHO and one from UNDP, the conference is expected to lead to increased research activities and to improved cooperation amongst universities and entities active in environmental programmes. A limited number of copies of the publication is available through the Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS), Casilla 4337, Lima, Peru. It is available in Spanish only but includes English versions of 3 papers and a special presentation.

U.S.A.

STORAGE TANKS FOR CAPACITY REDUCTION

J. Borrelli and Th.M. Rachford discuss in the Journal of the Environmental Engineering Division, Proceedings of the American Society of Civil Engineers, 1973, 99, No. EE4, pp. 517-533, a procedure for selecting the combination of storage and water supply system. With the addition of water storage, reduction in pipe diameter may be obtained, which does not necessarily result in appreciable cost reduction, since other costs, such as the cost of power, will increase.

ALGAE ABSTRACTS - A GUIDE TO THE LITERATURE

This publication was prepared from material supplied by the Water Resources Scientific Information Center, Office of Water Resources Research, Washington D.C. It is intended as a guide to the literature on water purification and the close relationship between algae and water. Volume I covering the period prior to and including 1969 comprises 569 entries; Volume II covers 1970-1972 and contains 730 entries, with every entry providing complete bibliographical information and a full abstract.

REVIEW OF WELL CONSTRUCTION STANDARDS

Under an Environmental Protection Agency grant, well construction standards are being reviewed.

Reference documents being considered include a draft of the Compendium of Well Construction Standards and the key to the Water Well Description Criteria. After Regional Well Specification Committees of the National Water Well Association, 88E. Broad Street, Columbus, Ohio 43215, have suggested changes, public comments will be used to develop the final draft.



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newsletter

No. 45 - September 1974

Bangladesh

BAMBOO TUBEWELL

The Bangladesh Observer of 12 July 1974 carried an article on the use of bamboo tubewells to exploit the abundant ground-water resources of the Bangladesh delta. Utilization of underground water is especially important for agriculture since thousands of acres can not be cultivated because of a lack of facilities for irrigation during the dry season. Bamboo tubewells were used in India in 1968 and in the following five years some 18 000 were installed in Bihar and West Bengal. Casing and strainer are made as a cylindrical frame by tying 2.5 cm wide and 3 meter long bamboo strips around metal rings with strings made of coconut husks. Lengthening of the cylindrical frame is done by wedging in bamboo strips at the joint where the ring is attached. The casing section is wrapped with gunny which is smeared with coal tar to make it watertight; for the strainer the bamboo strips are spaced 2.5 cm apart and coir string wound around the pipe. Two or three tubewells with a diameter of 10 cm can be connected to one centrifugal pump, which pumps the groundwater from 6 - 8 meter below ground level.

France

CASE OF TYPHOID

Prof. J. Brisou of the Laboratory of Microbiology of the Centre Hospitalier et Universitaire de Poitiers reported on a typhoid epidemic in the village of Couhé-Vérac near Poitiers, where some sixty cases of typhoid were observed in June - July 1974. Responsible for the disease was S Typhi lysotype E I a, chemotype I which was isolated from 45 patients; 72% of the patients are less than 15 years old and only 25% are older than 20 years while 56% are masculine. All the patients have recovered.

The epidemic was due to faecal contamination as a result of a break in the distribution system and a deficiency in chlorination. From seven patients, an Echovirus type 7 was isolated from the faeces; this may be a coincidence as the population may have been infected previously by the Echo 7; another possibility is the contamination of the water by the typhoid bacteria as well as by the virus (Echo 7).

India

NATIONAL ENVIRONMENTAL ENGINEERING RESEARCH INSTITUTE

The Central Public Health Engineering Research Institute (CPHERI), Nehru Marg, Nagpur 440020, India, which is a WHO Regional Reference Centre for Community Water Supply and Wastes Disposal, has been renamed the National Environmental Engineering Research Institute as of July 4, 1974. This new name implies a broader role for the Institute in the area of water supply and wastes disposal.

Peru

EVALUATION OF WATER SUPPLY AND SEWERAGE PROGRAMS IN LATIN AMERICA AND THE CARIBBEAN

In the February 1974 Newsletter a summary of the progress in water supply and sewerage program in Latin-America and the Caribbean was given for the period 1961 - 1971. An updated version including statistical information of 1972 is now published. Like the original report the updated version called "Evaluation of water supply and sewerage programs in Latin-America and the Caribbean" is in the Spanish language and is available from the Centro Panamericano de Ingeniería Sanitaria y Ciencias del Ambiente (CEPIS), Avenida Salaverry 722, Lima, Peru.

United Kingdom

VIRUS REMOVAL BY SLOW SAND FILTERS

Investigations at experimental slow sand filters of the Metropolitan Water Division of the Thames Water Authority, New River Head, Rosebery Avenue, London EC1R 4TP, indicate that when large numbers of virus are removed, the bacteriological results are good and vice versa.

Typical reductions at filtration rates of 20 cm per hour are:

<u>E. Coli</u>	<u>Poliovirus I</u>
92.9 per cent	99.6 per cent
91.7 per cent	98.3 per cent

This is rather unexpected since poliovirus is much smaller than E.Coli and would normally be expected to penetrate a filter more easily. This would further indicate that slow sand filtration is a highly effective way of removing viruses from water and that E.Coli is a suitable organism for measuring the virus removing ability of the filter.

From a virological point of view it appears that higher filtration rates could safely be used, especially in warmer weather. More results are however needed on larger scale beds.

USA

RAPID TEST OF FREE AVAILABLE CHLORINE

A rapid, specific, free available chlorine test with Syringaldazine (FACTS) is described and comparisons with other methods in common use is made. Copies of the publication can be obtained from Maj. Charles A. Sorber, U.S. Army Medical Bioengineering Research and Development Laboratory, Aberdeen Proving Ground, Maryland 21010.

U.S.S.R.

COAGULANT FROM INDUSTRIAL WASTE

Sukač, S.P. and Antončuk, Z.I. have investigated the possibility of using ferric sulphate prepared from waste of TiO₂ production and which contains ironsulphate and sulphuric acid as a coagulant in water treatment. Ferric hydroxide which is precipitated, is 1,5 times heavier than aluminum hydroxide, is more stable in alkaline waters and less sensitive to temperature changes. The coagulating properties are similar to alum. Results are reported in Vodosnabženie, Kanalizacija, gidrotehničeskie sooruzhenija 13 (1971), p. 8-12.

Publications received

1. United Nations, Directory of Activities of International Voluntary Agencies in rural development in Africa E/CN.14/SWCD/61/Rev. 2, 24 October 1972 (compiled by the Economic Commission for Africa).
2. Rural Development Newsletter published by the Voluntary Agencies Bureau - UNECA, P.O. Box 3001, Addis Ababa, Ethiopia.
3. Bulletin no. 1 of the Information and Reference Center in Sanitary Engineering and Environmental Sciences (in Spanish), University of Chile, Tupper No. 2140, Santiago, Chile.
4. Annual Report 1973 RIWA (Rhine Commission Waterworks) in Dutch. Secretariat RIWA, Condensatorweg 54, Amsterdam-Sloterdijk, The Netherlands.
5. CEPIS - Second Quarterly Report (in English) Pan American Center for Sanitary Engineering and Environmental Sciences, CEPIS, Casilla Postal 4337, Lima, Peru.
6. Ten-Year Health Plan for the Americas. Special Meeting of Ministers of Health of the Americas, Santiago 2-9 October 1972. Official Document no. 118. Pan American Health Organization, 525 Twenty-Third Street NW, Washington DC, USA.
7. Proceedings National Symposium on Public Water Supplies in Pakistan, Lahore, 6-7 November 1973. Institute of Public Health Engineering Research, West Pakistan University of Engineering and Technology, Lahore, Pakistan.



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newsletter

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Australia

POLLUTION INDICATORS IN NEW GUINEA

R. Feachem of the Department of Civil Engineering, University of Birmingham, reports in Water Research, vol. 8, p.367-374 (1974) on a study of faecal streptococci concentrations in streams in the highlands of New Guinea. Enumerated by the membrane filtration technique they were found to be good indicators of faecal pollution caused by human beings and pigs. Data on coliform and streptococcal flora under local conditions are needed to arrive at a good interpretation of the results.

Information: R. Feachem, Department of Civil Engineering, University of Birmingham, P.O. Box 363, Birmingham B15 2TT, England.

Czechoslovakia

CZECHOSLOVAK BIBLIOGRAPHY

Bibliographies on general and environmental hygiene, hygiene of children and adolescents and food hygiene are published annually in English, Russian and Czech by the Institute of Hygiene and Epidemiology, Prague, together with the Research Institute of Hygiene, Bratislava. They contain short reviews of articles published in Czechoslovakia. Copies of the bibliography (the last one covering 1972 articles) may be obtained at no cost from the Institute of Hygiene and Epidemiology, Srobarova 48, 100 42 Prague 10.

India

DEFLUORIDATION

The development of a medium called "Defluoron-2" for the removal of excess fluorides from water was reported in our Newsletter of March 1971. Extended laboratory tests and pilot plant studies led to improvements of the quality of the product. Updating of cost analyses was also the reason for a revised booklet on defluoridation which was published in December 1973 by the Central Public Health Engineering Research Institute (now National Environmental Engineering Research Institute).

In fluoride-problem areas in India, concentrations of 1-3 mg/l, 3-5 mg/l and over 5 mg/l of fluoride are reported. Where absence of this element in the human diet leads to "dental caries", the above excessive values can lead to a disease called fluorosis, which manifests itself in mottled enamel of the teeth. Defluoron 2 is a sulphonated medium developed from indigenous material. When fluoride containing water is led through a bed of Defluoron 2, which is contained in a cylindrical vessel, fluoride is removed leading to a low residual concentration in the water. This fluoride removal capacity depends on the bicarbonate alkalinity of the raw water. For said value equivalent to 160 mg CaCO₃/l the defluoridation capacity is 560 mg per litre of medium, when the raw water contains 5 to 7 mg/l of fluorides; high alkalinities have a reverse effect, also low concentrations of fluorides lead to lower capacities. The exhaustion of the bed is easily observed by a sharp break-through of say 1,2 mg/l of fluoride appearing in the effluent. The bed is then regenerated by contacting it with a 4% alum solution during 30-40 minutes. Nearly the whole cost of operation is the cost of alum required. Indian waters containing 3 to 10 mg/l of fluoride can be treated at a cost of \$0,04 to \$0,19 per cubic metre.

Information: National Environmental Engineering Research Institute, Nehru-Marg, Nagpur-440020, India.

PREVENTIVE MAINTENANCE OF WATER DISTRIBUTION SYSTEMS

In the Newsletter of May 1972, attention was drawn to a WHO assisted Training Course on Preventive Maintenance of Water Distribution Systems, organized by the then Central Public Health Engineering Research Institute; technical assistance

was provided by the United Kingdom's Water Research Association (now Water Research Centre), while the Bombay locality was taken as a case study. The course was held from 17 January to 18 February 1972 in Bombay.

Leakages in a water distribution system may lead to 40 to 50% of "unaccounted for water", and are potential sources of pollution of delivered water. Upgrading a distribution network for improving the capacity of a city's water supply in needy areas, such as exist in developing countries, well merits prime consideration. For this purpose trained personnel in the field of operation and maintenance of water distribution systems are very much needed.

A Course Manual on the topic was published by the Central Public Health Engineering Research Institute, Nehru Marg, Nagpur-440020, India. It deals with: field studies of distribution systems (principles and instrumentation); waste control: principles, equipment, methods, economics, planning and procedures; biological assessment and engineering control measures.

A final report on the WHO-assisted CPHERI Course was also published (September 1972) by the then Water Research Association, Ferry Lane, Medmenham, Marlow, Bucks. SL7 2HD, England. It gives an evaluation of this project and gives recommendations for similar courses for India and other countries.

For further information, please contact the institutes mentioned above.

U.S.A.

AMERICA'S DRINKING WATER IN 1974

On September 26 and 27, 1974 a National Symposium on the State of America's Drinking Water was held in Chapel Hill, North Carolina. Important addresses included: the impact of the Safe Drinking Water Act of 1974; Drinking Water Standards in 1974: development criteria; Drinking Water Standards in 1974: surveillance and program evaluation; research on environmental health hazards in the water environment; Drinking Water Strategies in 1974 and beyond.

Papers presented dealt with health relationships of today's water supplies; viruses; organic chemicals; inorganic chemicals; evaluating state drinking water quality surveillance programs. On the topic Water supplies for rural areas and small communities, discussions were held on problems in small systems; design and financing of small systems; problems of individual supplies; legal controls for protecting underground sources of drinking water; emergency supplies; approach to provision of rural water supplies.

The state-of-the-art of water supply was discussed in papers on: design; rates; training; mathematical optimization; demand forecasting.

When available, proceedings of this 1974 National Symposium on the State of America's Drinking Waters can be ordered through: F.E. McJunkin, Water Resources Research Institute, North Carolina State Building, Raleigh, N.C. 27607, U.S.A.

Reports received

1. Study in environmental engineering sciences, College of Engineering, University of Florida, Gainesville, Florida 32611, U.S.A.
2. Thirty-fifth Annual Report 1973 of the Metropolitan Water District of Southern California, Los Angeles, California, U.S.A.

For information please contact the relevant institutes.

Congresses and Symposia

1. National Exhibition of the Water Services Industry (in conjunction with Annual Conference of the Institution of Water Engineers). Harrogate, 3 - 5 December 1974. Information: Tower Exhibitions Limited, Bridge Street, Caversham, Reading, Berks., U.K.
2. Information Management in Community Water Supply and Waste Disposal. Nagpur, 11 - 12 December 1974. Information: Dr. G.K. Seth, National Environmental Engineering Research Institute, Nehru Marg, Nagpur 440020, India.
3. River gauging by ultrasonic and electromagnetic methods. Reading, 16 - 18 December 1974. Information: The Conference Organizer, The Water Research Centre, Ferry Lane, Medmenham Laboratory, Marlow, Buckinghamshire SL7 2HD, U.K.
4. Second International Congress on Industrial Waste Water and Wastes. Stockholm, 4 - 7 February 1975. Information: Secretariat Waste Congress, Box 5607, S-11486, Stockholm 5, Sweden.
5. The Effects of Storage on Water Quality. Reading, 24 - 26 March 1975. Information: Mr. L.C.W. White, Water Research Centre, Medmenham Laboratory, Marlow, Buckinghamshire SL7 2HD, U.K.



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News from IRC

STUDIES ON PUBLIC WATER DISPENSING DEVICES

In view of the great needs for an increased drinking water supply and the importance public water dispensing devices will have in such programmes, a study is being undertaken by IRC to identify water saving devices for public watering points and ways and means applied for dispensing the water. The study, which has the support of the International Bank for Reconstruction and Development (IBRD) will involve the following areas of investigation:

- a) identification of all devices, currently in use, previously employed or suggested for use, by design, ideas, patents or models and which could be used in urban and rural water systems for the public dispensing of water;
- b) determination of methods and approaches for the control of public watering points which rely on operational and administrative techniques to dispense water to the public.

Any information which may contribute to the study including indication of places worthwhile to be visited, is welcomed at the IRC, 13 Parkweg, The Hague, The Netherlands.

Federal Republic of Germany

DATA BANK FOR HARMFUL SUBSTANCES

The Institute for Water Research in Dortmund is developing a model for a data bank for harmful substances in water. Important data to be stored and which should readily be available when requested, cover the following: chemical-physical properties, toxicity to water organisms and man, detection methods, methods of removal in treatment works, general information, storage and transport regulations, technical applications, suppliers.

For information please contact Institut für Wasserforschung G.m.b.H., 5841 Geisecke/Ruhr, Dortmunder Stadtwerke A.G., Dortmund.

QUALITY CHANGES IN BANK FILTRATION

In treating surface waters, passage of water through underground layer in case of bank filtration or artificial recharge can bring about quality improvement, provided that sufficient oxygen is available. Aeration before information may be required. This subject is discussed in "Chemical problems in water abstraction by bank filtration and artificial recharge", by K. Haberer of the Wiesbaden Waterworks, Oesterreichische Wasserwirtschaft (1973), vol. 5/6, No. 25, p.103-110 (in German). For information please contact K. Haberer, Stadtwerke Wiesbaden A.G., 62-Wiesbaden.

Mexico

ENVIRONMENT, HEALTH AND DEVELOPMENT IN THE AMERICAS

Organized by the Pan American Health Organization in collaboration with the Pan American Centre for Sanitary Engineering and Environmental Sciences (CEPIS), the symposium on Environment, Health and Development in the Americas was held in Mexico City from 29 July to 2 August of this year. It was attended by delegates from 25 countries in different stages of development and with differing environmental problems. Confronted with worsening environmental conditions it was generally realized that rational planning and management are needed to achieve national programmes of health and development. In the recommendations emphasis was placed on the effects of environmental variables on economic and social de-

velopment and suggestions made for protection of the environment. Reference was also made to institutional structures and programme financing, the need for application of the latest findings in pollution control, the role of technology innovation and transfer in solving environmental problems. Proceedings will be published by CEPIS, Avda. Salaverry 722, Lima, Peru.

Peru

NATURAL COAGULANT AIDS

A paper in Spanish by Cliff Kirchmer and co-workers on "Natural Polymers and their applications as flocculation aids" was presented at the XIVth Inter-American Congress of Sanitary Engineers (AIDIS) held in Mexico City from August 4 to 9, 1974. It describes the work done at CEPIS on the use of Sodium alginate derived from brown marine algae Phaeophyceae and Tuna-floc prepared from the cactus *Opuntia Ficus Indica*. Both polymers gave the same characteristics as commercial synthetic flocculant aids, in coagulating waters to which kaolinite was added. For information, please contact the Pan American Centre for Sanitary Engineering and Environmental Sciences (CEPIS), Avda. Salaverry 722, Lima, Peru.

Sweden

MICROSIEVING OF RAW WATER

In the treatment works for the city of Jönköping, raw water from lake Vättern is filtered in slow sand filters (rate 0,25 m/hr), post-treated and collected in a low reservoir, before being distributed as drinking water. By installing micro-sieves before the slow sand filters, plankton is removed; this brings the number of 5 filter cleanings per year down to 3. A cost evaluation shows the proposed installation to be economical. Another important advantage is the longer filtering period between cleanings, which makes the cleaning in the cold winter months unnecessary.

United Kingdom

FLUID FLOW MEASUREMENT

R. Dowden, in "Fluid flow measurement, a bibliography", gives some 24 literature references on methods of measuring fluid flow in open and closed conduits. It was published by The British Hydromechanics Research Association, Cranfield, Bedfordshire in 1972.

U.S.A.

HAZARDS OF CHARCOAL FILTERS

Undesirable substances causing odours and tastes in drinking water can be removed by inserting a charcoal filter in domestic systems. This however can lead to an accumulation of organic matter and bacteria, as discussed by C. Wallis et al, in Water Research, 8, (1974) No. 2, p. 111-113. Especially stagnation of the water in the night may cause an increased colony count.

News from WHO

DRINKING WATER SUPPLY AND SANITATION FOR RURAL AREAS

A special Technical Panel on Drinking Water Supply and Sanitation for Rural Areas met in Geneva from 7-16 October at the initiative of seven sponsoring international agencies to develop a medium-term programme of technology transfer and applied research in this field. The Panel was made up of 15 specialists from 12 countries. The technical Panel's purpose was to develop a programme designed to overcome the problems of the application of existing technology, determine the best methods of transferring information and establish the need, if any, for further research in this area. In the last three days of its discussion, the Panel briefed 7 experts on the scope, content and objectives of the programme. The 7 experts, sanitary engineers and administrators, will survey institutes in Africa, Asia, Europe and Latin America to assess their technical capabilities, potential for expansion and ability to coordinate and stimulate research and apply existing technology. It is planned that the final recommendations of both groups will be presented to potential donor agencies both governmental and private, who may take an interest in the implementation of the various recommendations made.



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Czechoslovakia

REMOVAL OF RESIDUAL COAGULANT

I. Přecechtěl describes in *Vodní Hospodářství*, series B, 1974, XXIV, No. 10, p. 255-257 a method for removing residual coagulant in treated water by adding small quantities of finely ground limestone in the treatment process. In the waterworks of Jirkov an improved quality of the treated water has been obtained as well as an increase of filtration capacity of about 15%.

India

INFORMATION MANAGEMENT

A workshop on Information Management in Community Water Supply and Waste Disposal was held at the National Environmental Engineering Research Institute, Nehru Marg, Nagpur-20, from 11 - 12 December 1974, during which the following topics were discussed:

- 1) Characteristics, testing and evaluation of information
- 2) Problems of storage and retrieval of information
- 3) Communication and dissemination techniques
- 4) Education and training of information workers in developing countries including administration and management.

This Workshop closely followed a meeting in WHO headquarters to review the WHO "Draft Guide on Information Systems for Planning and Evaluation of Community Water Supply and Community Wastewater Disposal Programmes". The workshop has given indications to IRC (and WHO) as to the appropriateness of the guide to situations in this part of the world. In late 1975 the proposed UNDP-assisted WHO Inter-Regional Training Course on the Collection, Analysis and Evaluation of Data on Community Water Supply and Wastes Disposal Services for senior national community water supply and wastes disposal planners, which might be held at IRC, will give further opportunity for field testing the guide.

DOMESTIC REMOVAL OF EXCESS FLUORIDE

Permissible and excessive limits of fluoride in drinking water in India have been set at 1,0 and 2,0 mg/l respectively. Domestic treatment of waters containing excess fluoride is described in Technical Digest No. 46 of the National Environmental Engineering Research Institute, Nehru Marg, Nagpur-20, India. According to the Nalgonda technique, described limepowder is added to raw water in a container of 20 to 60 liters capacity and mixed well for one minute. Alum solution is then added and the water stirred slowly for ten minutes; the treated water is allowed to settle for one hour and is withdrawn without disturbing the sediments. In the process the fluoride content is reduced to about 1,0 mg/l; the quantity of lime and alum required depends on dissolved solids, alkalinity and fluorides in the raw water.

Luxemburg

FLUORIDATION

In a resolution on dental health, Ministers deputies' of the Council of Europe, recognizing the seriousness of dental disease to the community, underline the importance of fluoridation by stating that the most effective way of increasing resistance to dental caries is the fluoridation of drinking water and suggest that it should be fluoridated to a fluoride content of about 1 mg per liter.

Thailand

ENVIRONMENTAL TECHNOLOGY AND MANAGEMENT

The Asian Institute of Technology in Bangkok is starting a postgraduate diploma program in Environmental Technology and Management as from January 1975. The program will emphasize the principles and technologies required for a rational approach to the management of air and water pollution, radiation, noise, pesticides and occupational hazards likely to be of concern in Asian countries. Applications should be directed to the Chairman, Environmental Engineering Division, Asian Institute of Technology, P.O. Box 2754, Bangkok, Thailand.

News from I.R.C.

NEW ADDRESS FOR I.R.C.

As from December 1, 1974, the WHO International Reference Centre for Community Water Supply moved into its new premises on the Nieuwe Havenstraat 6, Voorburg ZH, Netherlands. The new facilities have ample room for an increased program of activities as planned by the Centre for 1975.

Among recently received publications, are:

Environmental Research in 1973, Annual Report, U.S. Environmental Protection Agency, National Environmental Research Center, Cincinnati, Ohio 45268, U.S.A.

Nineteenth Annual Report 1973/74, Water Research Centre, formerly the Water Research Association, Ferry Lane, Medmenham, Marlow, Buckinghamshire SL7 2HD, England.

Annual Report 1973, CEPIS, Pan American Center for Sanitary Engineering and Environmental Sciences, Avda. Salaverry 722, Lima, Peru.

Prognosis of Water Needs in the Federal Republic of Germany up to the Year 2000; (in German), Battelle Institute e.V., Frankfurt a. Main, for the Ministry of the Interior, 1972.

Czech. Standards for Drinking Water
CSN 83 06 11

Bibliography of R & D Research Reports, EPA-600/5-73-002, July 1973, Office of Research Development, U.S. Environmental Protection Agency, Washington, D.C. 20460.

Biological aspects of lead: annotated bibliography (1950-1964), U.S. Environmental Protection Agency U.S. Government Printing Office, Washington D.C., 1972.

State-of-art review: Water pollution control benefits and costs I, U.S. Environmental Protection Agency, Socio-economic Environmental Studies Series, EPA-600/5-73-008 a, U.S. Government Printing Office, Washington D.C., 1973.

Research needs and priorities: water pollution control benefits and costs II, U.S. Environmental Protection Agency, Socio-economic Environmental Studies Series EPA-600/5-73-008 b, U.S. Government Printing Office, Washington D.C., 1973.

Hungary and the International Hydrological Decade, National Water Authority of the Hungarian People's Republic, H-1011 Budapest, Fo" utca 48-50, Hungary.

For additional information please contact the relevant institutes.

Congresses and Symposia

Eight Public Health Engineering Conference on Aspects of Sewage Treatment. Loughborough, 6 - 7 January 1975.
Information: John Pickford, University of Technology, Loughborough, Leics. LE11 3TU, U.K.

International Symposium on Brackish Water as a Factor in Development. Beer-Sheva, 5 - 10 January 1975.
Information: Dr. A. Issar, P.O. Box 2053, Beer-Sheva, Israel.