Water Supply & Management, Vol. 2, pp.177-185.

0364-7714/78/0601-0177$02.00/0

Environmental Issues of Large Interregional Water Transfer Projects

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The problem of large water transfer projects is triune and consists of technology, socio-economy, and the environment.[1] Two principal questions exist on the environmental side of the problem:

(1) How does one evaluate efficiency of a project incorporating environmental issues which are sometimes not measureable?

(2) How does one predict environmental consequences of large water transfer projects?

In the planning stage, these questions are necessary for (a) assessment of the project's efficiency; (b) comparison of various options of water transfer schemes; and (c) comparison of various other alternatives with transfer schemes.

At the implementation and operational stage of the project, these questions are needed for optimal control of the environment. One of the obstacles in solving them concerns the problem of complexity and related problems of uncertainty. The number of components and links in a geoecosystem is very high. For instance, a quite simple geoecosystem of pine trees in sandy soils has about 2000 links. A simple set of geoecosystems of taiga forests covering an area of 2 X 4 km has some 20,000 links.[2] Consequently, the larger the territory, the more numerous the components and links. In moving up the hierarchical ladder, some links and components can be disregarded, just as some new ones will arise.

Thus, complexity of a natural environment grows with an expansion of the territory under study and, in the case of IWT, with the increase of its size. The following question arises: How certain can our assessments and forecasts of IWT projects be?

It seems to be obvious that uncertainty is a direct function of complexity, i.e. (1) the number of components and links is high, and our knowledge of all of them is inadequate for practical needs; (2) usually, only the most important components and links are regarded. However, in the taiga example mentioned above, some 50–80% of the information has been lost when out of 160 components, only the most important were taken into account;[2] and (3) uncertainty also increases if a question under study concerns an interaction between various spheres, i.e. atmosphere, hydrosphere, lithosphere, and above all, the biosphere. For example, a forecast of climatic changes – due to an IWT project – at a macroscale requires the modelling of a hydrosphere–atmosphere interaction; the same forecast at a mesoscale level would involve the earth's surface also, that is, the lithosphere and biosphere. The former is difficult, but possible to calculate numerically; the latter is impossible to calculate for the time being.

Let us suppose that we can determine the uncertainty of a project in monetary terms. It will then be an exponential function of a project's size, shown as a solid line in Fig. 1. Expected errors of its determination are shown by dotted lines. When an irrigation project is

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developed for a single field, environmental consequences are known with rather high accuracy. Environmental impacts from a new irrigation system are also predictable but uncertainty would be higher than in the first case and an error of its determination would be greater. Environmental consequences of a set of irrigation systems (such as the California State Water Project) are more difficult to predict, and uncertainty is relatively high. Hence, uncertainty of environmental effects of new, large projects covering subcontinents and continents becomes quite high.

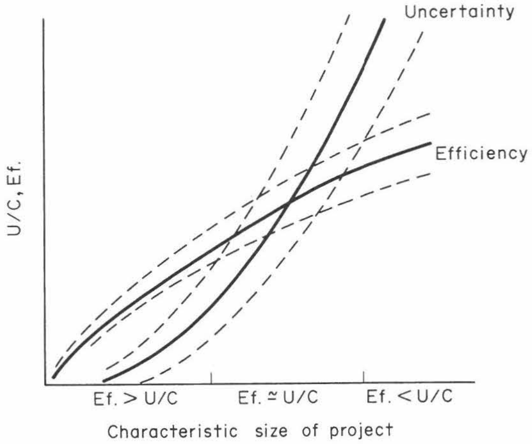

Fig. 1. Conceptual curves of uncertainty and efficiency vs characteristic size of project.

Let us further assume that we can determine efficiency of net benefits of a project – including environmental issues – in monetary terms. Axiomatically, the larger the project, the higher the benefit. The curve of efficiency is also represented in Fig. 1, and takes the intuitive form. Dotted lines show the accuracy of determination of efficiency.

There are three areas in Fig. 1: (1) efficiency is higher than uncertainty; (2) efficiency and uncertainty are the same within their accuracy; and (3) efficiency is inferior to uncertainty. For projects in the first area, the problem of uncertainty is not decisive. As for projects in the second area, they should be postponed unless other, non-economical objectives exist. Projects situated in the third area should be definitely declined, at least for the present.

There is apparently a certain project size above which the uncertainty of environmental consequences is so high that the project is not feasible. Examples of such projects include removal of ice in the Arctic Sea, and construction of huge water reservoirs to unify great river systems of South America, etc. With the progress of science and technology, the curve of uncertainty would shift to the right, and the curve of efficiency to the left; furthermore, location of the three areas would change in such a way that the critical size of a project would increase.

The approach discussed above is purely conceptual. It is, however, possible that very large water transfer projects are situated either in the second or even in the third area of Fig. 1 and, hence, their time for materialization has not yet come.

In the second half of this paper, environmental issues of a large IWT project in the USSR are discussed. There are many projects underway to reallocate water resources throughout the country. They can be grouped into three main options,[3] the second of which is the socalled Integrated Euroasian Option.

According to this option, water should be withdrawn from the Ob Bay near the mouth of the river, and at the first stage, in an amount equal to 25 km^3/yr. The water in Ob Bay is mostly fresh and its volume is comparable with the annual run-off of the Ob River, so that no artificial reservoir is required.

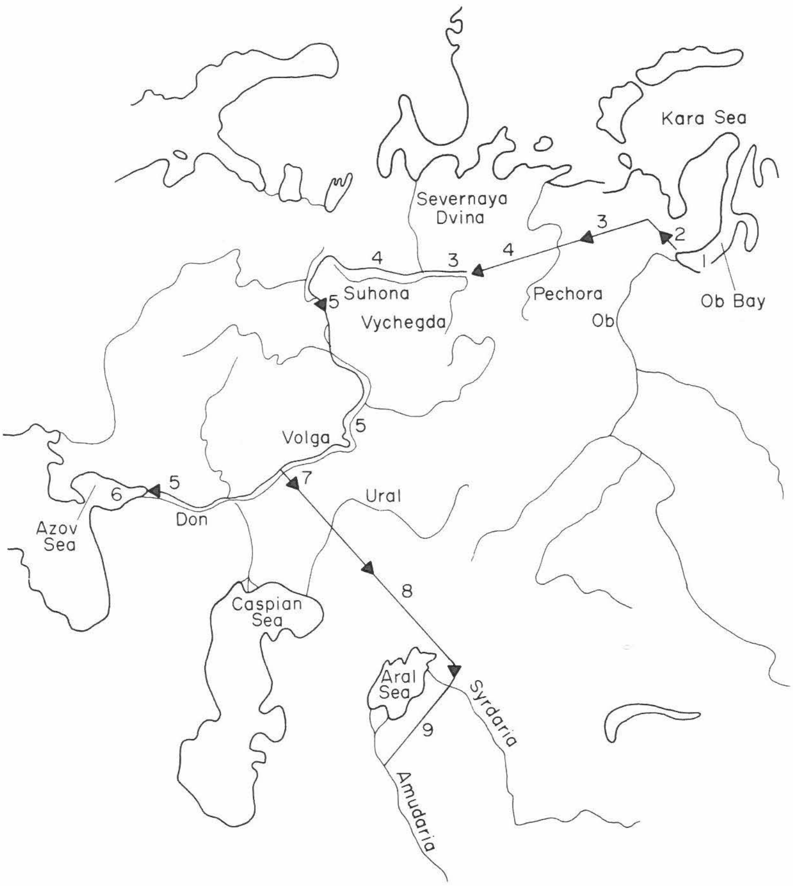

Fig. 2. Division of the IWT project by reaches.

Water would then be pumped over the Ural Mountains to the Pechora River Basin, flowing along the natural channels of the Usa and Pechora. It has been proposed to construct a chain of small reservoirs upstream from the Pizhma River (a left tributary of the Pechora), in order to move water further west. Water in amounts exceeding the withdrawal from Ob Bay would be pumped from the basin and would then use natural river channels of the Vychegda River basin. The same operation would be repeated on the western part of the Severnaya Dvina River basin; that is, by creation of an "anti-river" along the Suhona River by pumping additional water from Severnaya Dvina.

Finally, the water from the Ob, Pechora, and Severnaya Dvina Rivers would reach the Upper Volga, passing through a chain of reservoirs and power plants already created along the Volga River. It would compensate energy spent for pumping on other reaches of the project.

Part of the water in the Lower Volga would go to the Don River, flowing into the Azov Sea in order to improve its hydrologic regime. A major part of the water would travel along the canal between the Volga and Ural Rivers, partially used for new irrigation developments. Then the water would go by canal to the lower reaches of the Syrdaria and Amudaria Rivers for irrigation there. Water currently in use for irrigation of these areas would serve new developments in the middle and upper reaches of both rivers.

Obviously, this is a very complicated project covering enormous territories. My objective has been to determine the environmental consequences of such a big enterprise. In order to decrease uncertainty, the entire project was divided by reaches (see Fig. 2).

A method of trees of consequences or networks has been used. In the country, there are many studies underway on the various environmental aspects of IWT problems. (No reference to them is made here, but the reader may refer to the bibliography in this volume.[4] In some cases, there were no appropriate data, and I based much of my results on a general knowledge of the region and certain assumptions.) As a result, seven networks were constructed. There are no networks for two reaches, the Ural Mountains and the Ural and Syrdaria/Amudaria Rivers, as the engineering area has not been sufficiently cleared. Only the most important components and links are shown. The lower line of each network represents practical problems arising from environmental issues. All the networks are represented in Figs. 3–9. I will not discuss them in detail, but will just mention some of the highlights.

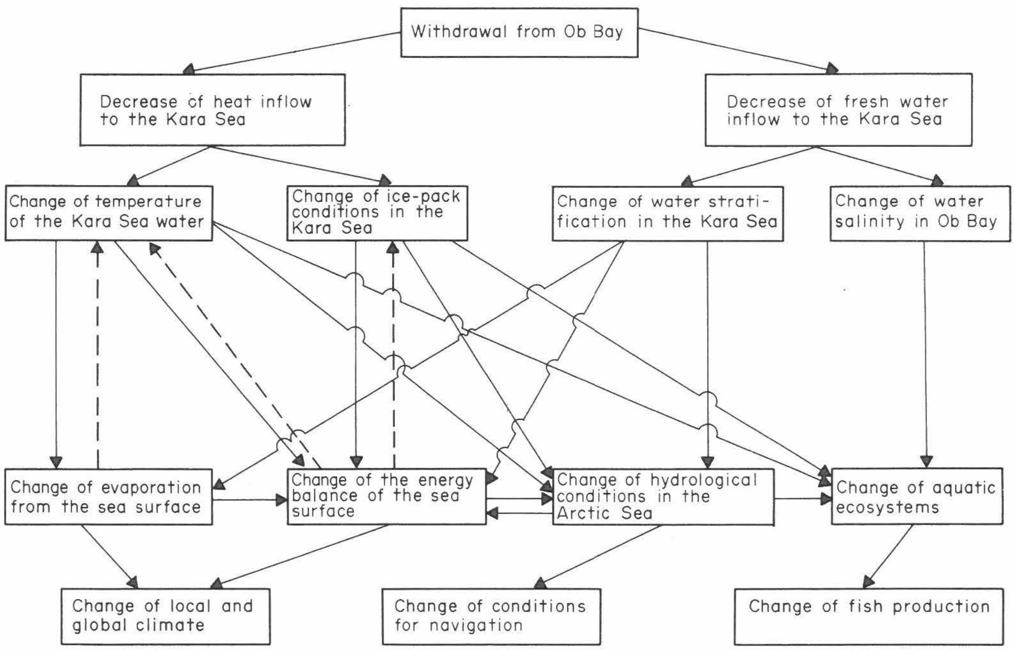

Fig. 3. Network for the 1st reach.

As previously mentioned, it has been proposed to remove 25 km^3/yr from the Ob Bay (Fig. 3). There will certainly be some impacts on many features of the Ob Bay which are very important to predict. At the same time, it is of vital importance to study the impacts on the Arctic Ocean, and a number of institutes in the USSR are working on the problem. The problem is two-fold: (1) the decrease in the amount of fresh water, heat, organic materials and

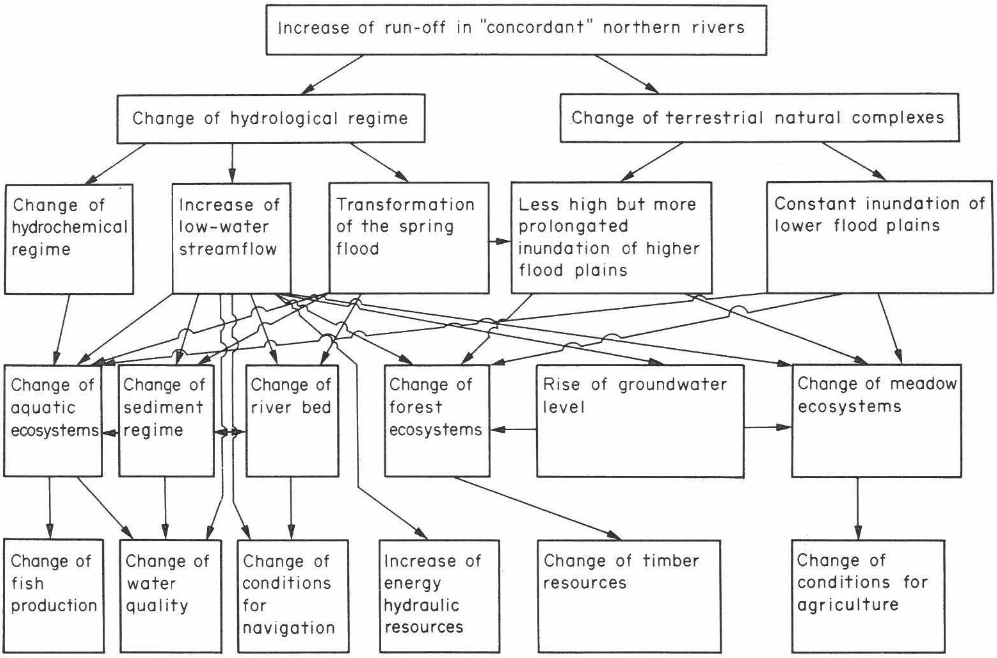

Fig. 4. Network for the 3rd reach.

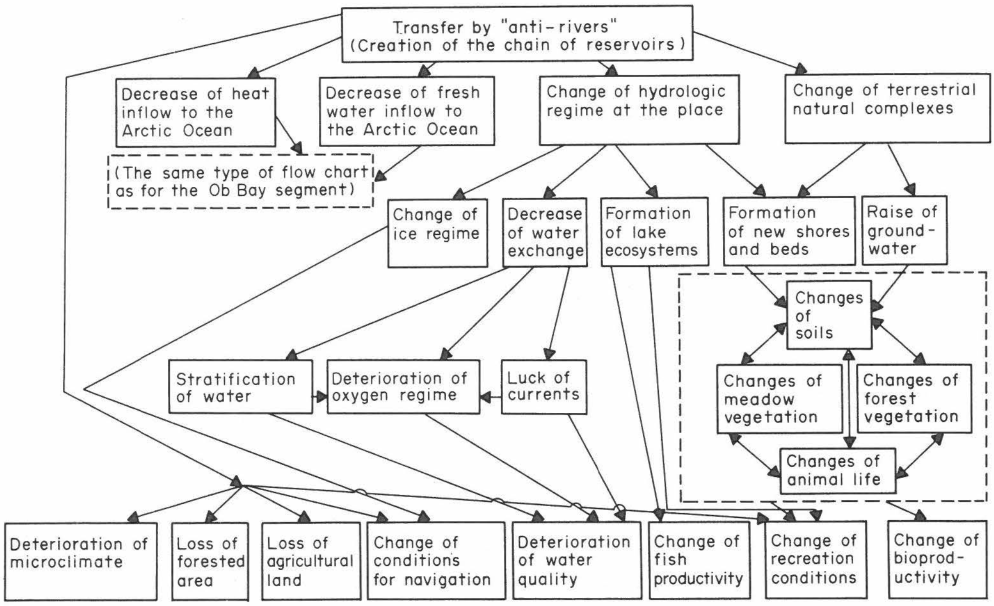

Fig. 5. Network for the 4th reach.

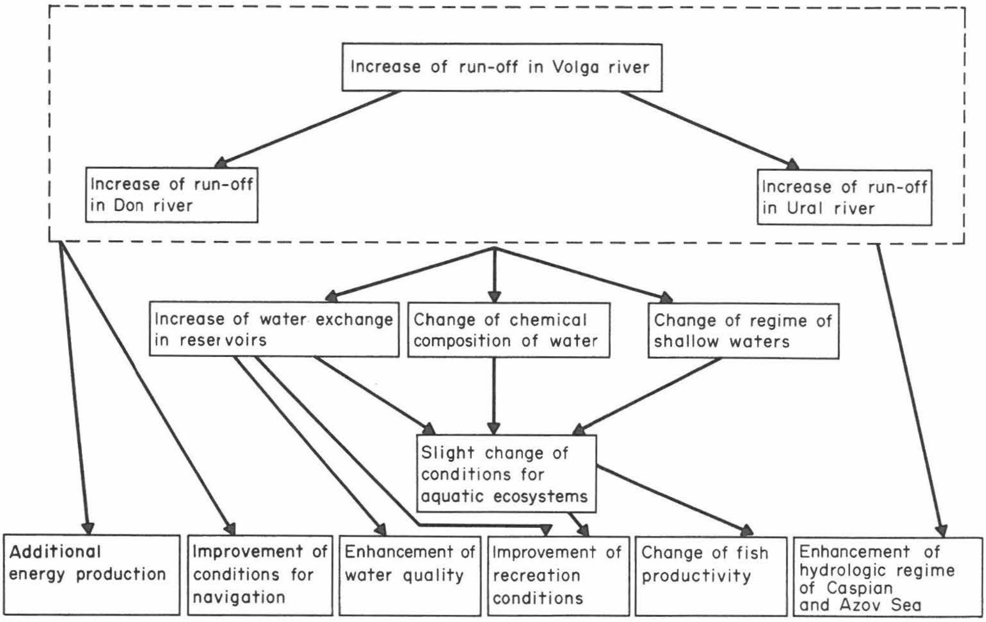

Fig. 6. Network for the 5th reach.

other kinds of inflow; and (2) the change of water stratification and consequent ramifications thereof.

As to the first issue, the mean annual run-off of the Ob River is about 400 km^3/yr. As a result of the project, 6% of this amount would be taken as the first stage and 15% as the final goal. The Kara Sea also receives 620 km^3/yr from the Enisey River. The percentage of withdrawn water in comparison with the run-off of these two great rivers would be correspondingly, 2 and 6%. Eight major rivers flowing from Asia to the Arctic Ocean bring 1950 km^3/yr. Comparing proposed withdrawals with this figure, we would have only about 1 and 3%, respectively. It would seem that all of these values are rather small, and that no considerable impacts are expected; the problem does, however, deserve more precise study.

As to the second issue, there is a stable stratification of water in the Arctic Ocean. Water salinity of 34 parts pro mille or less is situated above water of normal oceanic salinity (35 parts pro mille), and is about 50 m thick. The stratification is stable as less saline water is less dense.

Stable stratification allows for formation of an ice cover over the Arctic Ocean and, more broadly speaking, the actual type of interchange between the Arctic Ocean and the atmosphere with corresponding implications on global climate. A change in the stratification would this lead to many consequences, some of which are unpredictable.

There are two main sources of less saline water: river run-off inflow and net surplus of precipitation over evaporation for the whole area of the Arctic Ocean. Both sources are of the same order of magnitude. A slight decrease in the first component would result in a lesser decrease of the sum of both.

The balance of saline water is dynamic and formed as a result of the previously mentioned components, and the components describing an interchange between the Arctic Ocean and Atlantic and Pacific Oceans. A slight change in one of the components would lead to a different equilibrium of the entire system without drastic changes. However, the question is serious and is now undergoing careful study before a final decision is taken.

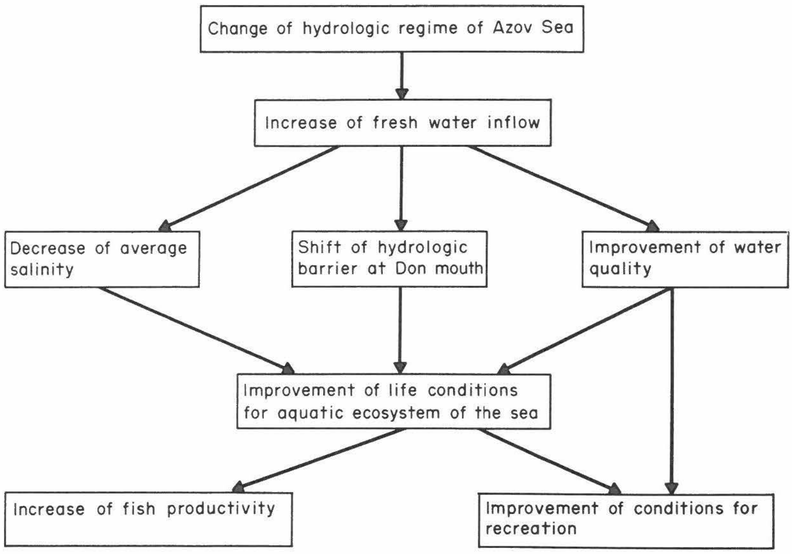

Fig. 7. Network for the 6th reach.

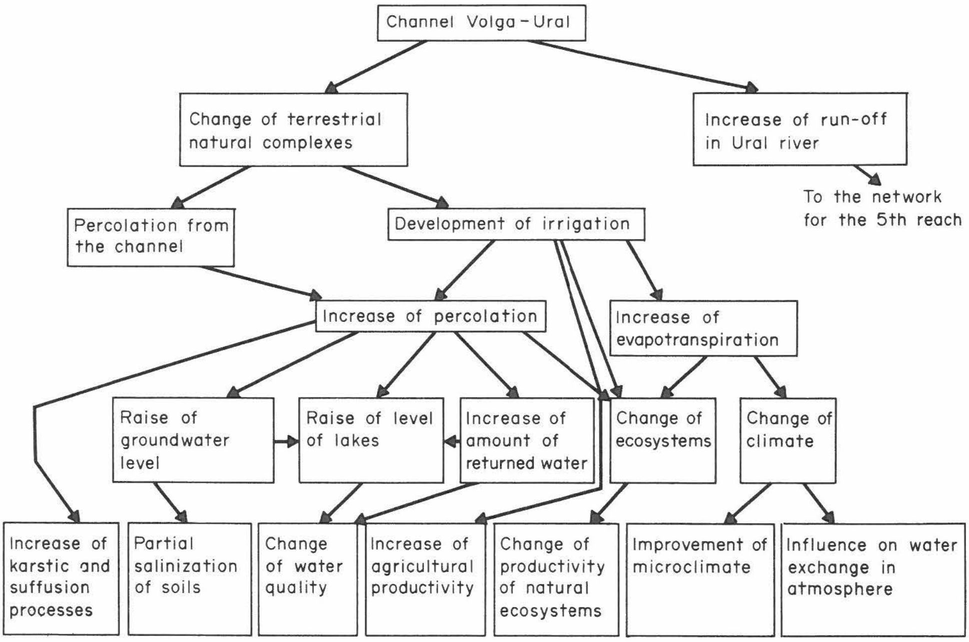

Fig. 8. Network for the 7th reach.

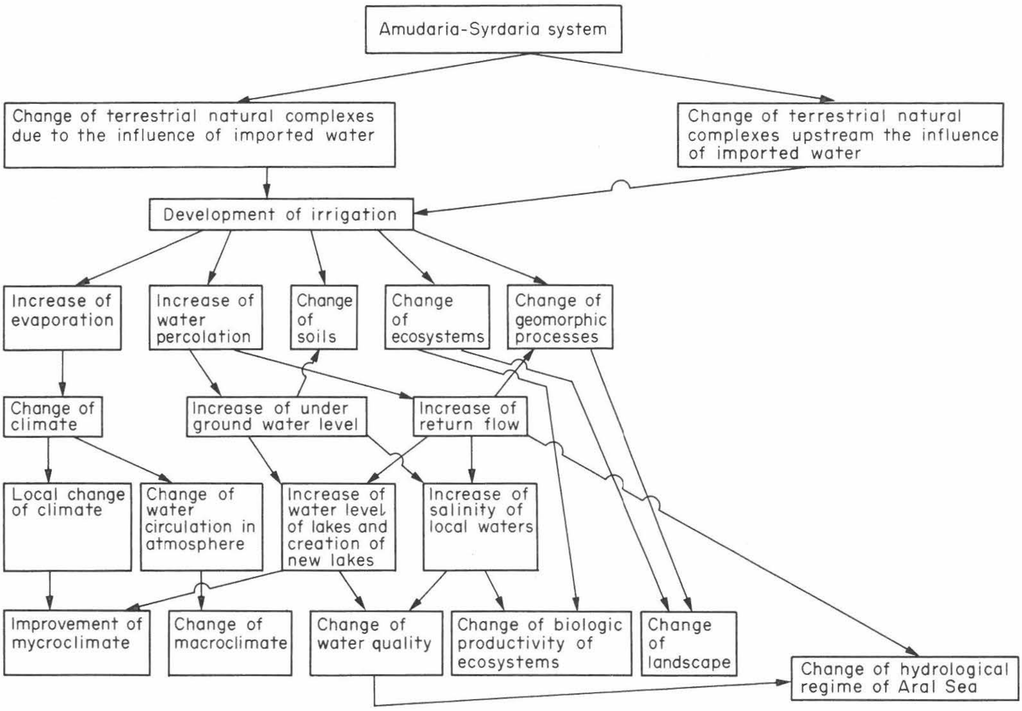

Fig. 9. Network for the 9th reach.

A considerable increase of river run-off will be along the natural channels of the rivers whose direction coincides with that of water transfers. Hydrologic regimes would change noticeably with an ensuing chain of consequences (Fig. 4). At the same time, all systems of interrelations characteristic of the lower levels of the river valleys would be affected drastically. Almost all rural life there is tied to these levels, hence reliable forecasting of events is necessary.

Creation of "anti-rivers" would lead to the classical environmental problem of water reservoirs: loss of land, deterioration of water quality, fish problems, erosion of coasts, etc. (see Fig. 5). The environmental impact of water reservoirs spreads also to adjacent territories. It is estimated[5] that for all water reservoirs of the USSR at the beginning of the 1970s, the area of impact is about 20 or 30 thousand km^2, i.e. approximately 30 or 40% of the total area of water reservoirs. Parallel with the universal problems of water reservoir, there are also regional, or rather, zonal problems. The reservoirs would be in the zone of excess precipitation over potential evaporation. This means that (1) losses of water to evaporation would be roughly the same as before creation of the reservoirs (which is favourable), and (2) additional excess of water would deteriorate terrestrial ecosystems. The main factor here is the rise of the groundwater level, which would bring a number of unfavourable consequences, for example, formation of new swamps and decrease of forest productivity.

An increase of run-off along the Volga River would be between 10 and 25% of the current annual flow at the mouth of the lowest tributary. In fact, it is now a chain of water reservoirs. It would seem that the effect of additional flow would be primarily favourable (Fig. 6).

Additional water transferred to the Azov Sea would bring desirable and positive effects (Fig. 7). The background necessary to carry out this part of the project has been described in this volume.[1]

As to the reach from the Volga to the Ural River, an increase of run-off in the latter is not the goal of the project and the main problems relate to the left branch of Fig. 8. A key problem seems to be percolation of water, either from the main canal which transports water south or, because of development of irrigation instead of dry farming. The percolation process produces a particular chain of consequences, and special attention should be given to proper water management there.

Finally, new water would be brought to the Syrdaria and Amudaria systems for further development of irrigation (Fig. 9). Specific problems of closed basins in arid zones would arise. Development of irrigation means removal of salts from the soils with returned waters. With plans to irrigate about 12 million ha in the year 2000, it will be necessary to remove 2 billion tons of salt. What would be its destination? Part of the salt would possibly go to the Aral Sea, which would turn into a relatively small, very salty lake. Because of the area's topography, not all returned waters would go to the Aral Sea and new closed lakes would form. Two have been formed in the last decade because of new developments in irrigation schemes and one is about 1000 km^2.

The networks (Fig. 3–9) and commentaries are, of course, subjective. The method itself has disadvantages which are discussed in a number of papers. At the same time, however, it is useful to single out the most important phenomenon and to manage and integrate scientific studies of environmental impacts of IWT projects.

REFERENCES

1. Golubev, G.N. and Vasiliev, O.F. *Interregional water transfers as an interdisciplinary problem* (in this issue).
2. Armand, A.D. *Information Models of Natural Complexes,* Nauka, Moscow, (in Russian), (1975).
3. Voropaev, G.V. Problem of reallocation of water resources of the country and its modelling. *Gidrotekh. Melior.,* 9, (in Russian), (1976). See also Voropaev's paper in this issue.
4. Golubev, G.N., Grin, G., Melnikova, G. and Whetstone, G. *Bibliography on water transfers* (in this issue).
5. Vendrov, S.L. and Diakonov, K.N. *Water Reservoirs and Environment,* Nauka, Moscow, (in Russian), (1976).

PART III: Bibliography on Interregional Water Transfers

Water Supply & Management, Vol. 2, pp. 187–211. Pergamon Press, 1978. Printed in Great Britain.

Bibliography on Interregional Water Transfers

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A bibliography on Interregional Water Transfers is presented below. Those sources have been selected which were related directly to problems and schemes of interregional (or large-scale) water transfers.

The bibliography contains 502 entries and as a rule, short notes have not been included. The majority of the publications are in languages of the Latin alphabet; the remainder are in the Cyrillic alphabet (Soviet papers), with corresponding translations into English.

As a considerable amount of publications are included in the list, it has been necessary to form sections according to items. Each section is listed alphabetically according to authors. The following sections are listed: General, Regional, Economy, Environment, Hydrology, Technology, Methodology and Water Management, and Politics and Law. The Regional section has been sub-divided into continents, plus the USSR which is situated in two continents. Of course, the divisions are quite relative. Many publications can be related to two or even more sections. We had intended to mention each source only once, but in about twenty instances the source is included in two or more sections.

The preparation for the bibliography has been carried out by an international group through IIASA's coordination. Professor G. Whetstone of the USA has kindly supplied IIASA with his voluminous bibliography on water transfers, which was one of the main sources of the present list. Selection from Professor Whetstone's bibliography has been made by the co-authors from IIASA. Dr. G. Grin, USSR, has prepared the main part of the Soviet bibliography. Final selection of sources, their divisional allocation and preparation for publication has been done by Professor G. Golubev and Dr. G. Melnikova, IIASA.

GENERAL

Agnew, Allen F. and Schuy, David F. *A new look at interbasin transfer*, Wenatchee Conf., Mimeo., 13pp. (April, 1972).

Bagley, Jay M. Water importation into arid lands, *Science*, **162**, 478–479 (1968).

Bagley, Jay M. and Smiley, Terah L. (eds), Water importation into arid lands (Symposium AAAS), in McGinnes and Goldman, *Arid Lands in Perspective*, Univ. of Arizona Press, (1968) pp. 337–421.

Banks, Harvey O. Teamwork in the solution of water problems, *Proc. Am. Soc. civ. Engrs*, **84** (IR-1), Paper 1497, 7 pp., DISC: (IR-3). Paper 1784, 23–25; **85** (IR-1), 67 (1958).

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Béchaux, J. Champ d'application et exemples de realisations de transports d'eau à grande distance (Field of application of the transport of water through great distances, with examples), *Houille Blanche*, **22**, 357–364 (1967).

Belyaev, I. P. *Interbasin transfer of water resources*, Working Paper 56. Original: English, UNDP/UN Interregional Seminar on River Basin and Interbasin Development, Budapest, Hungary, UN Dept of Economic and Social Affairs, (16–26 September 1975).

Cassidy, William F. *Water for cities*, Proc. 4th Am. Water Resources Conf., D. 34–41 (1968).

Clyde, George d. *The need for interstate water resource planning*, Proc. Western Interstate Water Conf., pp. 117–124 (1964).

Combes, G. and Saint-Laurent, F. Le transport de l'eau a grande distance (Water transport through great distances), *Houille Blanche*, **22**, 343–356, Summary: (In English) **22**, 356 (1967).

Cummings, Ronald G. *Interbasin Water Transfers—A Case Study in Mexico*, published by Resources for the Future Inc., distributed by Johns Hopkins Press, Baltimore and London, (1974).

Dersch, Eckhart *Water resources development—the river and the multi-basin region*, Cornell Univ. Water Resources Center Pbln. No. 11, pp. 1–15 (1965).

Domokos, Miklos *Evaluation of the effects of water transfer*, Working Paper 25, UNDP/UN Interregional Seminar on River Basin and Interbasin Development, Budapest, Hungary, UN Dept of Economic and Social Affairs (16–26 September, 1975).

Gardner, B. Delworth and Fullerton, Herbert H. Transfer Restrictions and the Misallocation of Irrigation Water, *Am. J. agric. Econ.* **50** (3), 556–71 (1968).

Hare, J. H. *Interbasin transport and water export*, Water Studies Inst. Colloq., Saskatoon, 24 pp. proc., (1971).

Hartman, L. S. and Seastone, Don, *Water Transfers: Economic Efficiency and Alternative Institutions*, Resources for the Future, Baltimore, (1970) 127 pp.

Horton, Robert E. Water division between drainage basins, *J. Am. Wat. Wks Ass.*, **24**, 1623–1683 (1932).

Howe, Charles W. Interbasin transfers: Do we need them? *Water Resour. Bull.* **7**, 670–675 (1971).

Howe, Charles W. and Easter, K. William, *Interbasin Transfers of Water*, Johns Hopkins Press, Baltimore, (1971) 196 pp.

Howson, Louis R. Factors affecting long-distance transmission of water, *J. Am. Wat. Wks Ass.*, **49**, 1359–1368 (1957).

Kuiper, Edward, Feasibility of water export, *Proc. Am. Soc. civ. Engrs*, **94** (HY-4), 873–891, DISC: **95** (HY-2), 727–728 (1968).

Lawson, J. D. Developments in water handling and management, *Aust. civ. Engng Constr.*, **10**, 29–34 (February 1969).

Laycock, Arleigh H. Canadian water for Texas? *Water Resour. Bull.*, **6**, 542–549 (1969).

Laycock, Arleigh H. *Interbasin transfer and Canadian water export?* Seminar, Johns Hopkins Univ., Baltimore, 25 pp. proc., Condensed reprint: *Reclamation* **12** (Spring), 3 (1971).

Maxwell, John C. Prospects for future water supply in the United States, *J. Am. Wat. Wks Ass.*, **57**, 549–553 (1965).

Mitchell, Grant C. *Interbasin transfer and export of water*, Ann. Conf. Canadian Water Resources Assn., Regina, 3 pp. proc., (1971).

Peterson, Dean F. *Philosophical consideration of water resource importation*, AAAS Symposium on Arid Lands, Dallas, Texas, pp. 398–405 processed, (30 December, 1968).

Poll, Charles, *Water Import Systems for Arid Land Development*, Int. Symposium on Increasing Food Production in Arid Lands, Monterrey, Mexico, pp. 43–54 (1969).

Quinn, Frank, Water transfers: Must the American west be won again? *Geogr. Rev.* **58**, 108–132 (1968).

Quinn, Frank *Images of Continental Water Engineering*, Seminar on the Continental Use of Arctic-Flowing Rivers, Washington State Univ., pp. 29–48 (1968).

Quinn, Frank J. *Area-of-origin protectionism in western waters*, Doctoral Dissertation, Univ. of Washington, 278 pp. +plates, (1970).

Quinn, Frank J. *Area-of-origin protectionism in western waters*, Environment Canada Social Science Series No. 6 (1973), 95 pp. +plates, Abst: *Reclamation* **13** (4), 11 (1974).

Reynolds, Robin R. *The water grid concept*, IIASA Task Force Meeting on Interregional Water Transfers, Laxenburg, (11–14 October, 1977).

Schramm, Gunter, Regional versus inter-regional efficiency in resource allocations, *Ann. Reg. Sci.*, **4**, 1–14 (December 1970).

Tinney, E. Roy, Criteria for analysis of interregional transfers of water, *J. Am. Wat. Wks Ass.*, **58**, 1369–1373 (1966).

Tinney, E. Roy, Water for western federal irrigation projects, in Campbell and Sylvester, *Water Resources Management and Public Policy*, Univ. of Washington Press, (1968) pp. 3–11.

Voropaev, Grigory V. *The scientific principles of large-scale areal redistribution of water resources in the USSR*, IIASA Task Force Meeting on Interregional Water Transfers, Laxenburg, (11–14 October, 1977).

Warnick, C. C. *Historical background and philosophical basis of regional water transfer*, AAAS Symposium on Arid Lands, Dallas, Texas, 30 pp., processed pp. 340–352 (30 December, 1968).

Whetstone, George A. Water power for the desert, *Water Power*, **13**, 388–390 (1961).

Whetstone, George A. *Interbasin diversion of water*, Proc. 4th Am. Water Resources Conf., pp. 490–498 (1968).

Whetstone, George A. Water as a commodity in international trade, *Water Resour. Bull.*, **5**, 65–71 (1969).

Whetstone, George A. Water diversion à la Française, *The Cross Section*, **15**, 2, 4 (15 April, 1969).

Whetstone, George A. *Continental water schemes*, Proc. ICASALS Arid Lands Symposium, Texas Tech, Lubbock, Texas, (1969).

Whetstone, George A. *The role of water exportation in national resources planning*, Engng Inst. of Canada, Annual Gen. Meeting, Ottawa, 12 pp. Proc., (1970).

Whetstone, George A. *Interbasin Diversion of Water: An Annotated Bibliography*, Vol. 1, WRC 70-2, Reproduced by the Texas Water Development Board, (1970).

Whetstone, George A. *Interbasin Diversion of Water: An Annotated Bibliography*, Vol. 2, WRC 71-1, Reproduced by the Texas Water Development Board, (1971).

Александровский, Ю. В., Баранов, В. А., Бостанджогло, А. А., Обрезков, С. С. и Шимельмиц, И. Я. Проблемы территориального перераспределения стока, *Труды IУ Всесоюзного Гидрологического Съезда*, Том **4**, Ленинград (1976).

Aleksandrovskiy, Yu. V., Baranov, V. A., Bostandzhoglo, A. A., Obrezkov, S. S. and Shimelmits, I. Ya. The problems of large-scale areal redistribution of runoff, *Tr. IV Vses. Gidrol. S"êzda*, Vol. **4**, Leningrad (1976).

Вендров, С. Л. Проблемы преобразования речных систем, *Гидрометеоиздат*, (1970).

Vendrov, S. L. The problem of river systems transformation, *Hydrometeoizdat*, (1970).

Вендров, С. Л. (Редактор) *Инженерно-географические проблемы проектирования и эксплуатации водохранилищ*, Наука, Москва, (1972).

Vendrov, S. L. (ed.) *Engineering and Geographical Problems in the Design and Operation of Water Reservoirs*, Nauka, Moskva (1972).

Воропаев, Г. В. Основные варианты территориального перераспределения водных ресурсов и связанные с ними научные проблемы, В сб.: *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий*, Ленинград, (1976).

Voropaev, G. V. Principal alternatives of water resources reallocation and related scientific problems, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy*, Leningrad, (1976).

Воропаев, Г. В. Задачи и организация научных исследований в связи с проблемой перераспределения водных ресурсов, *Водные ресурсы*, № 3, (1976).

Voropaev, G. V. The objectives and organization of research in connection with the problem of water resources redistribution *Vodn. Resur*. 3, (1976).

Грин, Г. Б. Об основных принципах разработки научных основ пространственного управления водными ресурсами, *Бюллетень по водному хозяйству СЭВ*, 16, (1975).

Grin, G. B. The basic principles of developing the scientific fundamentals of areal water resources management, *Bull. po Vodnomu Khozyaystvu SEV*, 16, (1975).

Дунин-Барковский, Л. В., Воропаев, Г. В., Бостанджогло, А. А., Ауце, Д. А. и Грин, Г. Б. *Территориальное перераспределение стока; исследования, масштабы, альтернативы*, XXIII Международный географический конгресс, Симпозиум: "Преобразование водного баланса под влиянием хозяйственной деятельности", Ленинград, (1976).

Dunin-Barkovskiy, L. V., Voropaev, G. V., Bostandzhoglo, A. A., Autse, D. A. and Grin, G. B. *Large-scale areal streamflow redistribution: investigations, extent and alternatives*, XXIII Mezhdunarodnyi Geograficheskiy Kongress, Simposium, Preobrazovaniya Vodnogo Balansa pod Vliyaniem Khozyaystvennoy Deyatelnosti, Leningrad, (1976).

Кулаков, В. В. Соотношение между тепловыми и водными ресурсами Европейской территории СССР в связи с перераспределением речного стока, Сб. *Формирование ресурсов вод суши*, Москва, (1972).

Kulakov, V. V. The relationship between the thermal and water resources of the USSR European part in connection with river flow redistribution, *Formirovaniye Resursov vod Sushi*, Moskva, (1972).

Проблемы регионального перераспределения речного стока, *Труды Ленинградского Политехнического института*, **№ 351**, (1976).

The problems of regional river flow redistribution, *Tr. Leningr. Politekh. Inst*. No. **351**, (1976).

Украинский, Ф. Я. К вопросу о народохозяйственном обосновании крупных перебросок стока, *Труды Гидропроекта*, сб. 29, (1973).

Ukrainskiy, F. Ya. Economic grounds for large-scale streamflow diversion, *Tr. Gidroproekta*, issue 29, (1973).

Фиалковский, П. Г. О единой водохозяйственной системе, *Гидротехника и мелиорация*, № 1, (1976).

Fialkovskiy, P. G. An integrated water supply system, *Gidrotekh. Melior*. No. 1, (1976).

REGIONAL PROJECTS

Africa

Anon., Projet d'un canal dans la Sahara (A proposed canal in the Sahara), *Nature, Paris* **3** (11), 141–142 (1875).
Anon., Un projet pour la mise en valeur du Sahara: La mer conduite a 400/km à l'interieurdu desert (A project for developing the Sahara: The sea led 400km into the desert), *Usine Nouv.* **11,** 13, 15, 17, 19 (Juin 1955).
Ball, John, The Qattara Depression of the Libyan Desert and the possibility of its utilization for power-production, *Geogr. J.*, **82,** 289–314 +plates, (1933).
Bassler, Friedrich, Scheme for the Qattara Depression, *Water Power,* **20,** 494–498 (1968).
Bassler, Friedrich, New proposals to develop the Qattara Depression, *Water Power,* **27,** 238–243, 291–297 (1975).
Government of South Africa, Interbasin water transfers in South Africa, *Aqua,* **1** (1/2), 242 (1977).
Guisan, R. La mer interieure d'Algerie (Algeria's interior sea), *Bull. Soc. Vaudoise Ing. Archit.* (*Bull. Tech. Suisse Romande*), **10** (1–4), (1884).
Halwani, Salah, Janod, Albert, and Lajeat, J. P. Le percement du tunnel d'Awali de l'amenagement du Litani au Liban (The driving of the Awali tunnel of the development of the Litani in Lebanon), *Travaux,* **49,** 247–260 (1965).
Hauet, A., Note sur la mer interieure (Note on the interior sea), *Mem. C. r. Trav. Soc. Ing. civ. Fr.* **11,** 110–119 (1883).
Helene, Maxime, La mer interieure d'Algerie (Algeria's interior sea), *Nature, Paris* **11,** 22–24, 35–38 (1882).
De Martino, Guiseppe, The Qattara Depression, *Water Power,* **25,** 27–31 (1973).
Matthews, P. E. Diversion of water to the upper region of the Tugela Basin, *Natal Town Reg. Rep.,* **16,** 30 pp. (1969).
Midgley, D. C. Apprisal and management of water resources in South Africa, *S. Afr. J. Sci.,* **67,** 210–217 (1971).
Myburgh, R. I. D. McC., The water projects of the Namib Desert, *S. Afr. J. Sci.* **67,** 152–158 (1971).
Van Robbroeck, T. P. C. *Inter basin water transfers in South Africa,* United Nations Water Conf., Mar del Plata, Argentina, Conf. Document E/CONF. 70 TP 223, 20 pp. (1976).
Roudaire, E. Une mer interieure en Algeria (An interior sea in Algeria), *Revue Deux Mondes,* 323–350 (15 Mai 1874).
Roudaire, E. La mer interieure Africaine (The African interior sea), *Mem. C. r. Trav. Soc. Ing. civ. Fr.,* **11,** 484–515, Disc: 482–483, 595–624 (1883).
Sirry, H. The Qattara power scheme, *Geogr. Rev.,* **19,** 290–292 (1929).
Soergel, Herman *Lowering the Mediterranean: irrigating the Sahara* (Panropa Project), Gebhardt, Leipzig, (1929) 48 pp.
Stallebrass, J. L. Regional water resources planning in South Africa, *S. Afr. J. Sci.,* **67,** 159–165 (1971).
Thorrington-Smith, E. *Toward a Plan for the Tugela Basin,* Town and Regional Planning Commission, Natal, Pietermaritzburg, (1960) 338 pp.
Wellington, John H. Zambesi–Okovango development projects, *Geogr. Rev.,* **39,** 552–567 (1949).
Whetstone, George A. *The Tugela–Vaal: a precedent-shattering diversion,* Short Papers: 8th Am. Water Resources Conf., pp. 14–15 (1972).
Whetstone, George A. Adaptation to aridity: water development in South Africa, *Water Resour. Bull.,* **8,** 600–607 (1972).

North America

Adams, Thomas C. Development of the Colorado River in the Upper Basin, *Trans. Am. Soc. civ. Engrs,* **105,** 1345–1365, Disc: **105,** 1366–1375 (1940).
Anon., The lake in the Colorado Desert, *Engng News, N.Y.,* **26,** 313–314 (1891).
Anon., The development of water power on the Chicago drainage canal, *Engng News, N.Y.,* **38,** 152 (1897).
Anon., The diversion of interstate waters, *Engng News, N.Y.,* **46,** 369–370; **47,** 301, 310 (1901).
Anon., The five dams and wood stave conduit of the Southern California Mountain Water Co., *Engng News, N.Y.,* **51,** 335–337 (1904).
Anon., California's long-range water plan, *Engng News Rec.,* **119,** 344–348 (1937).
Anon., Southwest plan would create regional water network, *Engng News Rec.,* **171,** 18–19 (5 September 1963).
Anon., Southwest should tap the Snake River, *Engng News Rec.,* **171,** 56–57 (14 November 1963).
Anon., Udall mediates Pacific Southwest water plan, *Engng News Rec.,* **172,** 14–15 (9 January 1964).
Anon., Water for all: Col. F. Z. Pirkey's plan (Western Water Project), *West. Wat. News,* p. 2 (16 January 1964).
Anon., Fryingpan–Arkansas Project, *West. Constr. News,* **42,** 45–52 (July 1967).

Anon., *South Saskatchewan River Project*, Queen's Printer, Cat. No. A22-7368, Ottawa, 32 pp., litho, (1967).
Anon., Six-state water plan proposed, *Am. Cy Meg.*, **83**, 164 (June 1968).
Anon., Water diversion study fires uproar in Ontario, *Engng News Rec.*, **183**, 23 (24 July 1969).
Armstrong, Ellis L. The undersea aqueduct: A new concept in transportation, *Proc. Am. Soc. civ. Engrs*, **98** (TE 2), 303–310 (1972).
Banks, Harvey O. *et al.*, *The California Water Plan*, California Dept of Water Resources, Bull. No. 3, 246 pp. +plates, (1957).
Basic Facts Booklet, *California Water Project*, California Dept of Water Resources, Division of Operations and Maintenance, (April 1973).
Bayley, Fred H. III, Possible diversion of Mississippi River flows, *Proc. West Texas Wat. Conf.*, **9**, 19–25 (1971).
Bayley, Fred. III, *West Texas and Eastern New Mexico water import study*, Paper, Am. Water Resources Conf., Baton Rouge, 34 pp. (1975).
Beck, R. W. and Associates, *A new water plan for the Great Plains*, Paper presented at Mid-West Elect. Consumers Assn., 50 pp., Proc., (8 December 1967).
Boswell, Howard B. *The Texas Water Plan*, pp. 24–29 (1969).
Branch, L. V. The Colorado River Aqueduct: Aqueduct operating program, *Engng News Rec.*, **121**, 677–679 (1938).
Burdick, Quentin N. *Garrison diversion unit, Missouri River Basin project*, Senate Report No. 470, 89th Congr., 1st Session, 15 pp. (1965).
Burleigh, Harry P. *The bureau of reclamation and the Mississippi River export plan.* Symposium on Aspects of the Diversion of Mississippi River Water to Texas and New Mexico, pp. 95–106 (1969).
Burleigh, Harry P. Export of Mississippi River water to Texas and New Mexico, (a portion of a Symposium), *J. Am. Wat. Wks Ass.*, **62**, 367–369 (1970).
Campbell, Donald E., Marlow, Thomas A. and Wright, Roy L. Homestake delivery system pipeline, *Proc. Am. Soc. civ. Engrs*, **93** (PL-2), 71–83, Disc: **94** (PL-1), 187–189 (1967).
Cannon, D. E. *San Juan–Chama Project*, Proc. 14th New Mexico Water Conf., pp. 55–59 (1969).
Cassidy, William F. New England water supply, *J. Am. Wat. Wks Ass.*, **60**, 21–24 (1968).
Clark, Robert D. *The embattled colossus: New York City water supply system, its past, present and future*, Proc. 4th Am. Water Resources Conf., pp. 25–33 (1968).
Clinton, F. M., Director, Region 6, USBR, *Garrison Diversion Unit*, 86th Congr., 2nd Session House Doc. 325, 229 pp. +plates, (1960).
Cole, Donald B. Transmountain water diversion in Colorado, *Colo. Mag.*, **25**, 49–65, 118–135 (1948).
Cory, H. T. Closing the break of the Colorado River into the Salton Sink, Southern California, *Engng News, N.Y.*, **56**, 671–674, Edit: **56**, p. 687 (1906).
Criddle, Wayne D. *Water resources and needs in areas of deficiency—Utah*, Proc. Western Interstate Water Conf., pp. 50–57 (1964).
Cummings, Ronald G. *Interbasin Water Transfers: A Case Study in Mexico*, published by Resources for the Future Inc., distributed by Johns Hopkins Press, Baltimore and London, (1974).
Dealey, J. Q., Jr, The Chicago Drainage Canal and St Lawrence Development, *Am. J. Int. Law*, **23**, 307–328 (1929).
Debler, E. B. Inter-water-shed diversions by tunnels on United States reclamation projects, *Trans. Am. Soc. civ. Engrs*, **94**, 346–351, Disc: 368 (1930).
Dominy, Floyd E. *Water supplies for the Southwest—What of the future?* Proc. 13th Annual Water Conf., Las Cruces, NM, pp. 31–37 (28–29 March 1968).
Dunn, William G. *The modified Snake-Colorado project*, Hearings before the Subcommittee on Water and Power Resources of the Committee on Interior and Insular Affairs, US Senate, 90th Congr., 1st Session, on S.1004, S.1013, S.861, S.1242 and S.1409, pp. 718–728 (1967).
Eckart, Nelson A. The water supply system of San Francisco, *J. Am. Wat. Wks Ass.*, **32**, 751–794 (1940).
Edmonston, A. D. California proposes diversion of Feather River water to Southern California, *Civ. Engng*, **23**, 229–231 (1953).
Eggleston, Wilfrid, The South Saskatchewan River Project, *Can. geogr. J.*, **46**, 232–243 (1953).
Elder, C. C. The Colorado River Aqueduct as a supplement to local water-sources, *Trans. Am. geophys. Un.*, **23**, 23–103 (1942).
Engelbert, Ernest A. The origins of the Pacific Southwest water plan, *West. Resour. Pap.* **6**, 125–256 (1964).
Follansbee, Robert, Upper Colorado River and its utilization, *U.S. Geol. Surv. Water Supply Pap.*, **617**, 394 +plates, (1929).
Follansbee, Robert, Trans-mountain diversions in Colorado, *Trans. Am. Soc. civ. Engrs*, **94**, 359–367 (1930).
Freeman, John R. *et al.* Report on the proposed 226-mile aqueduct for the water supply of Los Angeles, Cal., *Engng News, N.Y.*, **57**, 93–97, Edit: **57**, 109, Letter to Ed., Wm. Mulholland, p. 329 (1907).

Freese, Nichols and Endress, *Report to Texas Water Development Board on Interbasin Canals and Pipelines*, 192 pp. +maps, (1967).

Garduno, Hector, Mestre, Eduardo and Tapia, Francisco, *Large-scale transfers within Master water planning in Mexico*, IIASA Task Force Meeting on Interregional Water Transfers, Laxenburg, (11–14 October 1977).

Gill, G. S., Gray, E. L. and Secklery, D. The California Water Plan and its critics: A brief review, in Seckler, D. (ed.) *California Water, A Study in Resource Management*, Univ. of California Press, Berkeley, CA, (1971).

Heinly, Burt A. The completion of the Los Angeles Aqueduct, *Engng News*, **69**, 1257–1268; **70**, 920–923; Edit: **69**, 1289, Disc: **70**, 318–320, 1095 (1913).

Hinds, Julian, Colorado river water for California, *Civ. Engng*, **7**, 573–575 (1937).

Hyatt, Edward, The Central Valley Project of California, *Civ. Engng*, **4**, 482–486, Disc: **5**, 31, 32, 180 (1934).

Hyatt, Edward, The Central Valley Project of California, *J. Am. Wat. Wks Ass.*, **30**, 389-401 (1938).

Iorns, W. V., Hembree, C. H. and Oakland, G. L. Water resources of the Upper Colorado River Basin—technical report, *U.S. Geol. Surv. Prof. Pap.*, **441**, 370 pp. +plates, (1965).

Johnson, Ralph B. *The area of origin and a Columbia River diversion*, State of Washington, Water Res. Center Rep. No. 5B, 41 pp. (1971).

Kelly, Roland P. *North American Water and Power Alliance—NAWAPA*, Proc. 3rd Am. Water Resources Conf., pp. 28–35 (1967).

Kendrick, John J. *Water importation to West Texas and New Mexico*, Proc. 13th Annual Water Conf., Las Cruces, NM, pp. 18–24, (28–29 March 1968).

Kierans, T. W. *The Great Replenishment and Northern Development Canal*, Joint Meeting EIC–ASCE–ICE, Toronto, 11 pp. Proc., (1965).

Kierans, T. W. *The Grand Canal concept: A means of linking the fresh water needs of the Great Lakes and the continent to the development of Northern Canada*, Symposium on The Fresh Water of New York State: Its Conservation and Use, State University of New York, Buffalo, pp. 87–98 (13–17 June 1966).

Knight, Oliver, Correcting nature's error: The Colorado–Big Thompson project, *Agric. Hist.*, **30**, 157–169 (1956).

Kuiper, E. Canadian water export, *Engng J.*, **49**, 13–18, Disc: 32–34 (1966).

Kuiper, E. Water utilization in Canada, *Engng Dig., Toronto*, **13**, 66–69 (13 June 1967).

Laycock, Arleigh H. *The rationale of water export and its implications for water resources in the north*, Proc. 2nd Northern Resources Research Conf., Whitehorse, Yukon, pp. 90–96 (1968).

Laycock, A. H. Water, Chapter 5 in Warkentin, *Canada, a Geographical Interpretation*, Methuen, Toronto, (1968) pp. 112–136.

Laycock, A. H. Canadian water for Texas? *Water Resour. Bull.*, **6**, 542–549 (1969).

Laycock, A. H. *Water development in Alberta's future: Problems and prospects—the demand for water export in the year 2000 A.D.*, Proc. Univ. of Calgary Seminar on The Environment of Alberta—Past, Present and Future, 7 pp. proc., (1971), Condensed reprint: *Reclamation*, **11** (2), 6 (1971).

Lee, F. C. and Stern, D. *A feasibility study of mainland shelf undersea aqueduct*, Report to the US Dept of the Interior, National Engineering Science Co., Pasedena, CA, (1965).

Lippincott, J. B. Southwestern border water problems, *J. Am. Wat. Wks Ass.*, **31**, 1–28 (1939).

Luther, Lawrence A. Reaching 240 miles across a desert for water, *Compress. Air Mag.*, **39**, 4452–4458 (1934).

McCammon, L. B. and Lee, F. C. Undersea aqueduct system, *J. Am. Wat. Wks Ass.*, **58** (7), 885–892 (1966).

McCasland, S. P. Water from Pacific Northwest for deserts of Southwest, *Civ. Engng*, **22**, 143–146 (1952).

McFarland, K. D. and Kelly, Roland P. *The NAWAPA concept*, Proc. 3rd West Texas Water Conf., pp. 125–133 (1965).

Magnusson, Knut, *Should Water in Western Canada be Exported to U.S.A.?* Mimeo., 31 pp. +plates (2nd edn.), (13 January 1966).

Merriman, R. M. Driving 91 miles of tunnels on the Colorado River aqueduct, *Engng News Rec.* **113**, 97–105 (1934).

Moss, Frank E. *et al. Western water development: A summary of water resources projects, plans and studies relating to the Western and Midwestern United States*, Committee Print, 88th Congr., 2nd Session, 101 pp., (1964).

Moss, Frank E. *Future U.S. water resources development*, Symposium (E. Roy Tinney, ed.) The Continental Use of Arctic-Flowing Rivers, Washington State Univ., pp. 133–151 (1968).

Nelson, Samuel B. *Snake-Colorado Project: A plan to transport surplus Columbia River Basin water to the arid Pacific Southwest*, Dept of Water and Power, City of Los Angeles, (1963).

Nelson, Samuel B. Increase water supply—don't allocate shortage, *Am. Cy. Mag.* **80**, 96–98 (March 1965).

Nelson, Samuel B. *Snake Colorado project*, Am. Soc. civ. Engrs Nat. Meeting, San Diego, CA, 16 pp. processed, (1968).

Van Norman, H. A. The proposed Los Angeles–Colorado River aqueduct, *Trans. Am. Soc. civ. Engrs*, **94**, 352–358, Disc: 368–376 (1930).

Northern Ontario Water Resources Studies, *Summary report on engineering feasibility and cost investigations*, Environment Canada, Inland Waters Directorate, Water Resources Branch, Ottawa, Canada, (1973).

Panero, Robert B. and Candella, Basil J. *Super projects*, Proc. 4th Am. Water Resources Conf., pp. 208–217 (1968).

Parker, Garald G. *et al.* Water resources of the Delaware River Basin, *U.S. Geol. Surv. Prof. Pap.*, **381,** 200 pp. +plates, (1964).

Parsons, The Ralph M. Company, NAWAPA: North American Water and Power Alliance, *North American Water and Power Alliance Conceptual Study*, Vol. 1, engineering. Ref. No. 606-2934-001, Los Angeles, (1964).

Parsons, The Ralph M. Company, *NAWAPA: North American Water and Power Alliance*, Parsons' Brochure 606-2934-19, Los Angeles, 50 pp., (1967).

Parson, The Ralph M. Company, *North American Water and Power Alliance Conceptual Study*, Vol. 1, engineering, (1974).

Parsons, The Ralph M. Company, *North American Water and Power Alliance Summary Report for Alaska*, (January 1977).

Preston, Porter J. The Colorado–Big Thompson Project, *Colo. civ. Engng*, **8,** 517–519 (1938).

Price, Bobby E. (ed.), *Aspects of the diversion of Mississippi River water to Texas and New Mexico*, Symposium, Louisiana Polytechnic Inst., 160 pp., (19 June 1969).

Price, Bobby E. Possible diversion of Mississippi River water to Texas and New Mexico, *Water Resour. Bull.*, **7,** 676–683 (1971).

Primus, C. L., Paul, L. and Anderson, I. H. *Water diversion proposals of North America*, Alberta Dept of Agric., Water Resources Div. 42 pp. +maps, (1969).

La Rue, E. C. Colorado River and its utilization, *U.S. Geol. Surv. Water Supply Pap.*, **395,** 231 pp. +plates, (1916).

Schneider, William J. Water data for metropolitan areas, *U.S. Geol. Surv. Water Supply Pap.* **1871,** 397 pp., (1968).

Sewell, W. R. Derrick, NAWAPA: A continental water scheme (symposium); pipedream or practical possibility? *Bull. atom. Scient.* **23,** 9–13 (23 September 1967).

Smith, Joe H. Jr, Water for a thirst continent: A condensation of the "Western States Water Augmentation Concept" by Lewis G. Smith, *Irrig. Age*, **3,** 10–15 (3 April 1969).

Smith, Lewis G. *Western States Water Augmentation Concept*, Fedn. of Rocky Mtn. States, Denver, 44 pp. +plates, (1967).

Smith, Lewis G. Toward a national water plan, Supplement to April issue of *Irrig. Age*. 24 pp. (1969).

Smith, Lewis G. *Concept for a Pacific Aqueduct System*, Denver, Colorado 8 pp. +plates, proc., (1972).

Smith, Stephen C. and Brewer, Michael F. *California's man-made rivers: History and plans for water transfers*, Div. of Agric. Sciences, Univ. of California, Berkeley, (1961).

Stam, G. G. *Regional development of the waters of the Colorado River through interbasin diversions*, UN Dept of Econ. and Soc. Affairs, International Seminar on River Basin and Interbasin Development, Budapest, Hungary, (16–26 September 1975).

Stetson, T. M. *Review of Pacific Southwest Water Plan*, Consulting Engineer report to Six-Agency Committee, Los Angeles, CA, (1964).

Symposium, Water needs of the Pacific slope, *J. Am. Wat. Wks Ass.*, **57,** 1238–1272 (1965).

Texas Board of Water Engineers and Three Federal Agencies, *Water developments and potentialities of the State of Texas*, Sen. Doc. No. 111, 85th Congr., 2nd Session, 175 pp. +plates, (1958).

Texas Water Development Board, *Water for Texas: A plan for the future (Preliminary)*, TWDB, viii+32 pp. +plates, (1966).

Texas Water Development Board, *The Texas Water Plan: Summary*, TWDB, Austin, xiii +50pp. +plates, (November 1968).

Texas Water Development Board, *The Texas Water Plan*, TWDB, 207 pp. + plates, (1968).

Thon, J. George and Campbell, Donald E. Homestake trans-divide water supply project, *Proc. Am. Soc. civ. Engrs*, **93** (PL-3), 1–14; Disc: **94** (PL-1), 195–196; **95** (TE-2), 389–390 (1967).

Tinney, E. Roy, *A broad view of the problem*, Symposium on Northwest–Southwest Water Diversion Issues, Oregon States Univ., pp. 1–10 (1967).

Tinney, E. Roy (ed.), Symposium on The Continental Use of Arctic-Flowing Rivers, Washington State Univ., 176 pp. (1968).

Tinney, E. Roy and Quinn, Frank J. *Canadian waters and arid lands*, AAAS Symposium on Arid Lands, Dallas, Texas, pp. 411–715, processed, (31 December 1968).

Trommershausen, W. E. *A new water resource plan for the Great Plains including importation from Canada* Western Water Resources Inst., Santa Fe, NM, 21 pp. + plates, (1969).

US Bureau of Reclamation, Region 6, *Supplemental report on Garrison diversion unit (initial stage—250,000 acres)*, USBR, Bismarck, ND, 61 pp. +maps, (revised February 1965).

US Bureau of Reclamation, *California undersea aqueduct pre-reconnaissance study*, US Dept of the Interior, Bureau of Reclamation, 106 pp. (1969).

US Bureau of Reclamation, *West Texas and Eastern New Mexico import project*, USBR, 202 pp. +plates, (1973).

US Department of the Interior, *Pacific Southwest Water Plan: report and appendix*, (August 1963).

Vandertulip, John J. *A plan for meeting the 1980 water requirements of Texas*, Texas Board Wat. Engrs., 198 pp. +plates, (1961).

Vandertulip, John J. *Water importation—current outlook*, Proc. 6th West Texas Water Conf., pp. 22–32 (1968).

Vandertulip, John J. and Seward, Lewis B. *The preliminary Texas water plan*, Texas Water Dept Board Rep. 31, pp. 1–28 (1966).

Watts, Calvin T. and Lafleur, Robert A. *Proposed diversion of Mississippi River water from the viewpoint of the basin of origin*, Symposium on Aspects of the Diversion of Mississippi River Water to Texas and New Mexico, Ruston, LA, pp. 9–23 (19 June, 1969).

Wells, Dan M. *Irrigation in the Texas High Plains and the Texas water plan*, Am. Soc. civ. Engrs, Irrig. and Drain. Conf., (1969) 16 pp. Proc.

West Texas and Eastern New Mexico, *Import project executive summary*, US Dept of the Interior, Bureau of Reclamation, (June 1973).

Weymouth, Frank E. The proposed Colorado River aqueduct and metropolitan water district, Abst: *Proc. Am. Soc. civ. Engrs*, **56,** 1283–1291 (1930).

Weymouth, F. E. The Colorado River aqueduct: Urgent need for the aqueduct, *Engng News Rec.*, **121,** 639–645 (1938).

Williams, R. B. The all-American canal is materializing, *Reclam. Era*, **25,** 162–164 (1935).

South America

Ackerman, Adolph J., Matthias, Franklin T. and Vogan, George O. Brazil's Paraiba–Pirai diversion project includes world's largest underground power station, *Civ. Engng*, **21,** 652–656, Correction: **22,** 112–113 (1951).

Anon., Irrigation projects in Peru, Based on reports of Charles W. Sutton, *Georgr. Rev.* **17,** 487–490 (1927).

Anon., The Paraiba–Pirai Diversion, *Water Power*, **5,** 286–293 (1953).

Anon., Choco development project, *Water Power*, **19,** 6, Editorial notes: 2, 100 (1967).

Cote, E. F. Quelques projets gigantesques (Some gigantic projects), *Houille Blanche* (Old Series), **5,** 65–67 (1906).

Enock, C. Reginald, Water power in the Andes, *The Engineer*, **106,** 313 (1908).

Glassner, Martin I. The Rio Lauca: Dispute over an international river, *Geogr. Rev.* **60,** 192–207 (1970).

Green, D. W. Chira-Piura: A project to improve irrigation in Northern Peru, *Water Power*, **27,** 309–318 (1975).

Mary, M., Le Perou: Ses resources hydroelectriques (The hydroelectric resourses of Peru), *Houille Blanche*, **14,** 450–456 (1959).

Meischeider, Herbert, The Jequetepeque multipurpose scheme in Peru, *Water Power*, **26,** 178–179 (1974).

Ministerio de Obras Publicos y Transportes, *El sistema Rio de la Unidad, esquema alternativa de analisis no. 101*, Oficinas Proyecto Rio de la Unidad, Direccion General de Aguas, Santiago, Chile, (1972).

Panero, Robert, *A South American "Great Lakes" system*, Report HI-788/3-RR, Hudson Inst. Inc., Croton-on-Hudson, NY, 29 pp. (1967).

Pieretti, J. G. and Cole, E. C. Caracas water supply lifted 3,125 ft over divide, *Civ. Engng*, **26,** 810–813 (1956).

Ribi, R. and Schlittler, F. Expanding the power supply for Lima, Peru, *Water Power*, **16,** 160–164, 243–250 (1964).

Riva, Jorge, J. C. Notas sobre un racional aprovechamiento de los recursos de agua superficial del extremo del continente Americano, entre los paralelos 38° y 49° S (Notes on a rational utilization of the surface water resources of the southern tip of South America, between the 38th and 49th parallels), *Water for Peace*, **8,** 594–608, English Summary, 607–608 (1967).

Tomasek, Robert D. The Chilean-Bolivian Lauca River dispute and the O.A.S., *J. Inter-Am. Stud.* **9,** 351–366 (1967).

Asia

Anon., The Indus Basin Project, Pakistan. An engineering solution to a political problem, *Wat. and Wat. Engng*, **71,** 441–452 (1967).

Buck, A. C. The Johore River Project—Singapore, *J. Instn Wat. Engrs,* **23,** 13–57 +plates, (1969).
Hodges, R. C. Indus Water for Pakistan, *Can. geogr. J.,* **61,** 96–105 (1960).
Savage, Christopher D. W. and Xarpenter, Thomas G. Indus Basin settlement scheme: T-S-M-B link canal system, *Proc. Instn. civ. Engrs,* **32,** 549–571, Disc: **35,** 184–204 (1965).
Syed, N. C. *Inter basin transfer of water resource: Case study of Indus project,* Working Paper No. 28, UNDP/UN Interregional Seminar on River Basin and Interbasin Development, Budapest, Hungary, United Nations Dept of Economic and Social Affairs, (16–26 September 1975).
Wiener, A., Irrigation water system—Israel's national water grid, *Water for Peace,* **7,** 195–205 (1967).

Australia

Anon., The Coolgardie Goldfields Water Supply, *The Engineer,* **85,** 57–58, 75–77 (1898).
Anon., The Coolgardie pipe line: A remarkable engineering problem, *Engng News, N.Y.,* **40,** 233–234 (1898).
Anon., The Snowy Mountains Scheme, *Engineering, Lond.* **182,** 232–235, 394–396, 630–633, 661–663 (1956).
Bradfield, J. J. C. *Watering Inland Australia,* Rydge's, pp. 586–589, 606 (1 October 1941).
Bradfield, J. J. C. Restoring Australia's parched lands, *Aust. Q.,* **14,** 27–39, (March), Disc: Leeper, G. W., **14,** 50–52, (June 1942).
Dann, H. E. *et al.,* The investigation, design, construction and commissioning of the Guthega Project of the Snowy Mountains scheme, *J. Instn Engrs Aust.,* **29,** 129–158 (1957).
Davies, I. A comprehensive water supply scheme—Western Australia, *J. Instn Engrs Aust.,* **21,** 1–9 (1949).
Hudson, Sir William, The Snowy Mountains hydro-electric project, *J. Instn Engrs Aust.,* **34,** 107–113 (1862).
Hunter, J. R. and Hartwig, W. P. The design and construction of the Tooma–Tumut project of the Snowy Mountains scheme, *J. Instn Engrs Aust.* **34,,** 163–185 (1962).
Idriess, Ion L. *The Great Boomerang,* Angus & Robertson, Sydney and London, (1945) 253 pp.
Loder, L. F. The Snowy River Scheme, *J. Instn Engrs Aust.,* **21,** 40–41 (1949).
Main, J. M. The Development of the Snowy River, *J. Instn Engrs Aust.,* **17,** 209–216 (1945).
Warrell, E. G. The Snowy Mountains Scheme—Australia, *Water for Peace,* **8,** 248–258 (1967).

Europe

Anon., Immense new water supply for Paris authorized, *Engng News Rec.* **108,** 316 (1932).
Van Hulten, M., Lelystad, Prospects for the development of inland water transport in Europe, *Geogr. J.,* **1,** (1977).
Rees, Judith, Thirsty land with a temperate climate, *Geogr. Mag.,* **42,** 136–145 (1969).
Schmidt, Fritz, Projection and development of long distance water supplies illustrated by the example of the Lake of Constance scheme, *Water for Peace,* **6,** 1003–1009 (1967).
Vie, Georges, Le Canal de Provence: Ses objectifs et sa construction (The Canal de Provence: Its objectives and its construction), *Genié civ.,* **144,** 545–548 (1967).

USSR

Anon. (C. M.), Des cours d'eau Russes seront detournes de l'Artique vers la Caspienne (Some Russian rivers are to be diverted from the Arctic to the Caspian), *Sci. Prog., Lond.,* **3325,** 221–222 (1962).
Anon. (C. M.), Pour maintenir le niveau de la Mer Caspienne (To maintain the level of the Caspian Sea), *Sci. Prog., Lond.,* **3343,** 453–454 (1963).
Anon. Objections contre l'amenagement de l'Ob (Objections to developing the Ob River), *Sci. Prog., Lond.,* **3344,** 492 (1963).
Anon. Du Ladoga à la Caspienne (From Lake Ladoga to the Caspian Sea), *Sci Prog., Lond.,* **3362,** 230 (1965).
Anon. Grandes derivations hydrauliques en projet en URSS (Large projected water diversions in Russia), *Construction,* **25,** 410 (1970).
Anon., Irrigation figures heavily in Russia's massive diversion program, *Wld Irrig.,* **18,** 14–16 (January 1968).
Dunin-Barkovsky, L. V., Voropaev, G. V. and Gerardi, I. A. The scientific basis for the territorial redistribution of the water resources of the USSR, Abst: *Aqua,* **1** (1/2), 207, (1977).
Micklin, Philip P. Soviet plans to reverse the flow of rivers: The Kama–Vychegda–Pechora project, *Can. geogr.,* **13,** 199–215 (1969).
Voropaev, Grigory V. *The scientific principles of large-scale areal redistribution of water resources in the USSR,* IIASA Task Force Meeting on Interregional Water Transfers, Laxenburg, (11–14 October 1977).
Аверьянова, А. Г. Бассейн Волги и его региональное водохозяйственное значение, *Водные ресурсы,* № 6, (1974).
Averyanova, A. G. The Volga Basin and its signficance as regional water supply, *Vodn. Resur.* No. 6, (1974).

Ануфриев, А. Ф., Братцев, А. П. Природные и экономические предпосылки переброски части стока р. Оби в бассейн Волги, Сб. *Проблемы энергетики Крайнего Севера*, ч. III, Якутск, (1975).
Anufriyev, A. F. and Brattsev, A. P. Environmental and economic circumstances of the diversion of part of the Ob River flow into the Volga Basin, *Problemy Energetiki Kraynego Severa*, Part III, Yakutsk, (1975).
Биндеман, Н. Н. К вопросу о перспективах использования подземных вод Казахстана в связи с проблемой переброски стока Сибирских рек, *Водныеи ресурсы*, № 4, (1975).
Bindeman, N. N. On the prospects of the utilization of Kazakhstan's groundwater in connection with the problem of diversion of the flow of the rivers of Siberia, *Vodn. Resur*. No. 4, (1975).
Бостанджогло, А. А. Проблемы перераспределения стока в СССР, *Труды координационного совещания по гидротехнике*, вып. **108**, (1976).
Bostandzhoglo, A. A. The problems of stream flow redistribution in the USSR, *Tr. Koord. Soveshch. po Gidrotekh.*, **108**, (1976).
Братцев, А. П. Новый взгляд на проблему переброски части стока р. Печоры на Юг, Сб. *Проблемы рационального использования естественных ресурсов и охраны природы Коми АССР*, Сыктывкар, (1975).
Brattsev, A. P. A new view to the problem of partial diversion of Pechora River runoff to the south, *Problemy Ratsionalnogo Ispolzovaniya Estestvennykh Resursov i Okhrany Prirody Komi ASSR*, Syktyvkar, (1975).
Вендров, С. Л. Некоторые аспекты межбассейнового перераспределения речного стока в Европейской части Союза и в Срединном регионе, Сб. *Влияние перераспределения стока рек бассейна Оби на природу тайги Срединного региона*, Иркутск, (1975).
Vendrov, S. L. Some aspects of the inter-basin redistribution of river flow in the European part and the Central region of the USSR,—*Vliyaniye Pereraspredeleniya Stoka Rek Basseyna Obi na Prirodu Taygi Sredinnogo Regiona*, Irkutsk, (1975).
Вендров, С. Л. Роль и интересы Западной Сибирской равнины в решении проблемы перебросок стока, Сб. *Вопросы антропогенных изменений водных ресурсов*, Москва, (1976).
Vendrov, S. L. The role and interests of the West Siberian Plain in the solution of the streamflow redistribution problem, *Voprosy Antropogennykh Izmeneniy Vodnykh Resursov*, Moskva, (1976).
Гангардт, Г. Г. К вопросу о переброске части неиспользуемого стока Северных и Сибирских рек в районы, испытывающие дефицит водных ресурсов, *Гидротехническое строительство*, № 8, (1971).
Gangardt, G. G. Diversion of part of the unused flow of the northern and Siberian rivers to areas with a shortage in water resources, *Gidrotekh. Stroit.*, No. 8, (1971).
Герарди, И. А. Проблема использования вод Обского бассейна для обводнения Казахстана и Средней Азии в комплексе с осушением Западно-Сибирской низменности, Сб. *Комплексное освоение водных ресурсов Обского бассейна*, Новосибирск, (1970).
Gerardi, I. A. The problem of utilization of the waters of the Ob Basin for irrigation in Kazakhstan and Central Asia, combined with the drainage of the West-Siberian Lowland, *Kompleksnoye Osvoeniye Vodnykh Resursov Obskogo Basseyna*, Novosibirsk, (1970).
Герарди, И. А. Воду сибирских рек засушливым землям юга, *Гидротехника и мелиорация*, № 12, (1972).
Gerardi, I. A. The rivers of Siberia must supply water to the arid areas of the south, *Gidrotekh. Melior.*, No. 12, (1972).
Герарди, И. А. О повышении водообеспеченности р. Волги и переброска части стока северных рек на юг, *Гидротехника и мелиорация*, № 11, (1973).
Gerardi, I. A. On the increase in water resources of the Volga and the partial diversion of the flow of the northern rivers to the south, *Gidrotekh. Melior*. No. 11, (1973).
Герарди, И. А. Природно-хозяйственные основы переброски части стока Сибирских рек в республики Средней Азии и маловодные области Казахской ССР, *Мелиорация почв Средней Азии, Казахстана и Западной Сибири в связи с переброской части стока Сибирских рек в южные районы страны*, Пущино, (1973).
Gerardi, I. A. Environmental and economic principles of the partial diversion of the flow of the Siberian rivers to the Central Asia Republics and the arid areas of the Kazakh SSR, *Melioratsiya pochv Sredney Azii, Kazakhstana i Zapadnoy Sibiri v Svyazi s Perebroskoy Chasti Stoka Sibirskikh rek v Yuzhnye Rayony Strany*, Pushchino, (1973).
Герарди, И. А. Единая государственная система регулирования и межбассейнового перераспределения водных ресурсов СССР, *Труды 1У Всесоюзного Гидродогического Съезда*, Том **4**, Ленинград (1976).
Gerardi, I. A. The state integrated system of water resources regulation and inter-basin redistribution in the USSR, *Tr. IV Vses. Gidrol. S''êzda*, **4**, Leningrad (1976).
Герарди, И. А. Технико-экономические соображения по переброске части стока Сибирских рек в республики Средней Азии и маловодные районы Казахстана, Сб. *Оценка Возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий*, Ленинград, (1976).

Gerardi, I. A. Technical and economic considerations in diverting part of the flow of the Siberian rivers to the Republics of Central Asia and the arid areas of Kazakhstan, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyanien Vodokhozaystvennykh Meropriyatiy*, Leningrad, (1976).

Дунин-Барковский, Л. В., Воропаев, Г. В. и Герарди, И. А. *Научные основы территориального перераспределения водных ресурсов в СССР,* Тезисы доклада, TP 165, Конференция Организации Объединенных Наций по мировым водным ресурсам, Мар-дель-Плата, Аргентина, (14-25 марта 1977).

Dunin-Barkovsky, L. V., Voropaev, G. V. and Gerardi, I. A. The scientific basis for the territorial redistribution of the water resources of the USSR, United Nations Water Conference, Mar Del Plata, Argentina, 14–25 March, Abst: *Aqua,* **1** (1/2), 207 (1977).

Зарубаев, Н. В. Комплексные исследования по обоснованию проекта межбассейнового перераспределения части стока Сибирских рек, *Труды Ленинградского политехнического института,* **№ 346,** (1976).

Zarubaev, N. V. Interdisciplinary studies to substantiate the project of inter-basin redistribution of the flow of Siberian rivers, *Tr. Leningr. Politekh. Inst.*, No. **346,** (1976).

Калачев, Н. С., Лаврентьева, Л. Д. и Казыбаев, А. К. Некоторые аспекты обводнения Казахстана и сопредельных с ним территорий водами сибирских рек, Сб. *Проблемы гидро энергетики и водного хозяйства,* вып. 8. (1971).

Kalachev, N. S., Lavrenteva, L. D. and Kazybaev, A. K. Some aspects of irrigation of Kazakhstan and adjacent areas with the waters of the Siberian Rivers, *Probl. Gidroenerg. Vodn. Khoz.*, issue 8, (1971).

Калачев, Н. С., Лаврентьева, Л. Д. и Павленко, В. П. Аргут–Катунь–Бухтарминский энерговодохозяйственный комплекс, Сб. *Проблемы гидро энергетики и водного хозяйства,* вып. 9. (1972).

Kalachev, N. S., Lavrenteva, L. D. and Pavlenko, V. P. The Argut–Katun–Bukhtarma irrigation and hydraulic power complex, *Probl. Gidroenerg. Vodn. Khoz.*, issue 9, (1972).

Кореньков, О. Б. Об использовании стока реки Волги для широкого развития орошения Нижнего Дона и Северного Кавказа, Сб. *Географические проблемы изучения и освоения природных ресурсов Нижнего Дона и Северного Кавказа,* Ростов-на-Дону, (1971).

Korenkov, O. B. The utilization of the Volga runoff for extensive development of irrigation in the Lower Don Area and in Northern Caucasus, *Geograficheskiye Problemy Izucheniya i Osvoeniya Prirodnykh Resursov Nizhnego Dona i Severnogo Kavkaza,* Rostov-na-Donu, (1971).

Кореньков, О. Б. О переброске в нижнее течение р. Дон части стока р. Волги для нужд народного хозяйства Ростовской области, Книга *"Совершенствование проектирования мелиорации и водохозяйственных объектов на Северном Кавказе",* Ростов-на-Дону, (1973).

Korenkov, O. B. On partial diversion of the Volga runoff to the Lower Don River to meet the economic requirements of the Rostov Region, *Sovershenstvovaniye Proektirovaniya Melioratsii i Vodokhozyaystvennykh Obektov na Severnom Kavkaze,* Rostov-na-Donu, (1973).

Кошелев, А. П. К истории вопроса переброски стока рек в России, Сб. *Природные условия Западной Сибири и переброска стока рек в Среднюю Азию,* Новосибирск, (1975).

Koshelev, A. P. The history of streamflow rechannelling in Russia, *Prirodnye Usloviya Zapadnoy Sibiri i Perebroska Stoka rek v Şrednyuyu Aziyu, Novosibirsk,* (1975).

Лисицина, И. Н. и Ронин, В. Л. Комплексное использование водных ресурсов Волги, *Гидротехника и мелиорация,* № 11, (1973).

Lisitsina, I. N. and Ronin, V. L. Integrated utilization of the Volga water resources, *Gidrotekh. Melior.*, No. 11, (1973).

Малик, Л. К. Нужно ли перебрасывать воды западносиоирских рек на юг, *Природа,* № 6, (1973).

Malik, L. K. Is there any need for the water of the west Siberian Rivers to be diverted southward? *Priroda,* No. 6, (1973).

Малинина, Т. И. и Распопов, И. М. *Озёра Лача, Воже, Кубенское как потенциальные ресурсы пополнения вод реки Волги,* Материалы Всесоюзной научной конференции по проблемам комплексного использования и охраны водных ресурсов бассейна Волги, вып. 1, Пермь, (1975).

Malinina, T. I. and Raspopov, I. M. *Lakes Lacha, Vozhe and Kubenskoe as potential resources to replenish the Volga Water,* Materialy Vsesoyuznoy Nauchnoy Konferentsii po Probleman Kompleksnogo Ispolzovaniya i Okhrany Vodnykh Resursov Basseyna Volgi, Vol. 1, Perm, (1975).

Мошков, А. Б. и Симаков, Г. В. Перспективы новых воднотранспортных соединений в связи с региональной переброской стока рек, *Труды Ленинградского Политехнического института,* **№ 351,** (1976).

Moshkov, A. B. and Simakov, G. V. The prospects of new water transport communications in connection with a streamflow diversion, *Tr. Lening. Politekh. Inst.*, No. **351,** (1976).

Перераспределение речных ресурсов, *Народное хозяйство Казахстана,* № 1, (1977).

The redistribution of river resources, *Nar. Khoz. Kazakhstana,* No. 1, (1977).

Природные условия Западной Сибири и переброска стока рек в Среднюю Азию, Новосибирск, (1975).
The Environment of West Siberia and the Diversion of the River Flow to Central Asia, Novosibirsk, (1975).
Сакс, В. Н., Широков, В. М. и Яншин, А. Л. Задачи научных исследований в Сибири при разработке вопросов переброски части стока рек в Среднюю Азию, Сб. *Природные условия Западной Сибири и переброска стока рек в Среднюю Азию,* Новосибирск, (1975).
Saks, V. N., Shirokov, V. M. and Yanshin, A. L. The objectives of research in Siberia to develop the problems of the partial diversion of the river flow to Central Asia, *Prirodnye Usloviya Zapadnoy Sibiri i Perebroska Stoka rek v Srednyuyu Aziyu,* Novosibirsk, (1975).
Саруханов, Г. Л. Переброска стока северных рек, *Труды Гидропроекта,* сб. 16, (1969).
Sarukhanov, G. L. Diversion of run-off of the northern rivers, *Tr. Gidroproekta,* issue 16, (1969).
Саруханов, Г. Л. *К переброске стока северных рек по Волжскому каскаду,* Вторая конференция по изучению водоёмов бассейна Волги, "Волга-2"; Борок, (1974).
Sarukhanov, G. L. *The diversion of the flow of the Northern Rivers through the Volga Cascade,* Vtoraya Konferentsiya po Izucheniyu Vodoemov Basseyna Volgi, Volga-2; Borok, (1974).
Саруханов, Г. Л. Переброска стока северных рек в Волгу, *Речной транспорт,* № 7, (1975).
Sarukhanov, G. L. The Diversion of the Northern Rivers Flow to the Volga, *Rechn. Transp.* No. 7, (1975).
Чокин, Ш. Ч. Проблемы водного благоустройства Срединного региона СССР. *Водные ресурсы,* № 6, (1974).
Chokin, Sh. Ch. The problems of water supply improvement in the central region of the USSR, *Vodn. Resur.* No. 6, (1974).
Чокин, Ш. Ч. и Калачев, Н. С. *Реки Сибири потекут в Казахстан и Среднюю Азию,* Алма-Ата, (1974).
Chokin, Sh. Ch. and Kalachev, N. S. *The Rivers of Siberia will Flow to Kazakhstan and Central Asia,* Alma-Ata, (1974).
Чокин, Ш. Ч., Захаров, В. П., Калачев, Н. С. и Киктенко, В. А. Территориальное перераспределение водных ресурсов и задачи гидрологических исследований в Срединном регионе СССР. *Труды IУ Весоюзного Гидрологического Съезда,* том **4,** Ленинград (1976).
Chokin, Sh. Ch., Zakharov, V. P., Kalachev, N. S. and Kiktenko, V. A. The large-scale areal redistribution of water resources and the objectives of hydrological research in the USSR Central Region *Tr. IV Vses. Gidrol St''êzda,* **4,** Leningrad (1976).
Шимельмиц, И. Я., Бостанджогло, А. А., Грин, Г. Б. и Ауце, Д. А. Некоторые аспекты проблемы изътия стока Сибирских рек для водообеспечения Средней Азии и Казахстана, Сб. *Влияние перераспределения стока рек бассейна Оби на природу тайги Срединного регноиа,* Иркутск, (1975).
Shimelmits, I. Ya., Bostandzhoglo, A. A., Grin, G. B. and Autse, D. A. Some aspects of the problem of the partial withdrawal of the flow of the Siberian rivers for the water supply of Central Asia and Kazakhstan, *Vliyaniye Pereraspredeleniya Stoka rek Basseyna Obi na Prirodu Taygi Sredinnogo Regiona,* Irkutsk, (1975).

ECONOMIC ASPECTS

Castle, Emery, N. *The economics of massive inter-basin water transfers,* Seminar on the Continental Use of Arctic-Flowing Rivers, Washington State Univ., pp. 153–163 (1968).
Crutchfield, James A. NAWAPA: A continental water scheme (symposium): Economic considerations, *Bull. atom. Scient.,* **23,** 17–21 (September 1967).
Cummings, Ronald G. *Inter-basin Water Transfers: A Case Study in Mexico,* Published by Resources for the Future Inc., Distributed by Johns Hopkins Press, Baltimore and London, (1974).
Easter, K. William, *Inter-basin water transfers—economic issues and impacts,* Proc. 4th Am. Water Resources Conf., pp. 191–200 (1968).
Eckart, N. A. Benefits accruing from the Hetch Hetchy Project, San Francisco water supply, *J. Am. Wat. Wks Assn.,* **28,** 1211–1231 (1936).
Hartman, L. M. *Water resources and economic development of the west,* Report No. 14, Conf. Proceedings of the Committee on the Economics of Water Resources Development of the Western Agric. Economics Research Council, Berkeley, CA, (1965).
Hartman, L. M. and Seastone, D. A. Efficiency criteria for market transfers of water, *Water Resour. Res.,* **1** (2), 165–71 (1965).
Hartman, L. M. and Seastone, D. A. Regional economic interdependencies and water use, in Kneese and Smith, *Water Research,* Johns Hopkins Press, Baltimore, (1966) pp. 215–231.
Hartman, L. M. and Seastone, Don, *Water Transfers: Economic Efficiency and Alternative Institutions,* Published for Resources for the Future Inc. by Johns Hopkins Press, Baltimore and London, (1970).
Heinly, Burt A. Surplus waters of the Los Angeles Aqueduct, *Engng News, N.Y.,* **69,** 506–510, Edit: **70,** 32 (1913).
Howe, Charles W. *Economics of large-scale transfers,* AAAS Symposium on Arid Lands, Dallas, Texas, pp. 371–382, processed, (30 December 1968).
Howe, Charles W. *Economic issues related to large-scale water transfers in the U.S.A.,* IIASA Task Force Meeting on Interregional Water Transfers, Laxenburg, (11–14 October, 1977).

Howe, Charles W. and Easter, K. William, *Inter-basin Transfers of Water: Economic Issues and Impacts,* Johns Hopkins Press, Baltimore, (1971).

Kuiper, E. and Murray, J., *Water supplies for North American food production,* 29 pp. Proc., (1967).

Linaweaver, F. P. Jr and Clark, C. Scott, Costs of water transmission, *J. Am. Wat. Wks Ass.*, **56,** 1549–1560 (1964).

Millham, C. B. and Russell, R. A. On the economic impact of large diversions of Snake River Waters, *Water Resour. Bull.*, **7,** 925–934 (1971).

Schramm, Gunter, Regional versus inter-regional efficiency in resource allocations, *Ann. Reg. Sci.* **4,** 1–14 (December 1970).

Sorensen, J. N. and Clark, R. T. Marginal value of irrigation water and a case study of transfer in Southeastern Wyoming, *Wyo. Agric. Exp. Stn. Bull.*, No. 511, 42 pp. (1970).

Stoevener, Herbert H. *The economics of water diversion,* Symposium on Northwest–Southwest Water Diversion Issues, Oregon State Univ. pp. 47–57 (1967).

Young, Robert A. and Martin, William E. The economics of Arizona's water problem, *Ariz. Rev.*, pp. 9–18 (16 March 1967).

Воробьев, Б. В. Влияние создания водохранилищ при переброске стока северных рек и озер в Волгу на сельское хозяйство, *Труды координационных совещаний по гидротехнике,* вып. 83, (1973).

Vorobyev, B. V. The effect of newly constructed water reservoirs on agriculture when diverting the water of the northern rivers and lakes to the Volga, *Tr. Koord. Sovesch. Gidrotekh.*, issue 83, (1973).

Пучкова, Н. В. Народохозяйственные предпосылки территориального перераспределения стока, *Труды Гидропроекта,* сб. **29,** (1973).

Puchkova, N. V. Economic prerequisites for large-scale streamflow redistribution, *Tr. Gidroproekta,* issue 29, (1973).

Сергин, С. Я. К целесообразности переброски Сибирских вод в Среднюю Азию, Сб. *Природные условия Западной Сибири и переброска стока рек в Среднюю Азию,* Новосибирск, (1975).

Sergin, S. Ya. Economic soundness of the diversion of Siberia's river waters to Central Asia, *Prirodnye Usloviya Zapadnoy Sibiri i Perebroska Stoka rek v Srednyuyu Aziyu,* Novosibirsk, (1975).

Хахин, Н. А. и Шатаева, С. Г. Оценка влияния на водный транспорт изъятия части стока Оби и Иртыша при переброске его в бассейн Аральского моря, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий,* Ленинград, (1976).

Khakhin, N. A. and Shataeva, S. G. Evaluating the effect of the partial withdrawal of the flow of the Ob and the Irtysh Rivers on water transport when conveying this part of the flow to the Aral Sea Basin, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustiev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy,* Leningrad, (1976).

ENVIRONMENTAL ISSUES

Berger, Bernard B. Social and ecological implications of proposals for out-of-basin river diversions, *Proc. Am. Soc. civ. Engrs,* **97,** 95–110 (1971).

Hagan, R. M. and Roberts, E. B. Ecological impacts of water projects in California, *Proc. Am. Soc. civ. Engrs, J. Irrig. Drain. Div.*, **98,** (IRI), 25–48 (1972).

McGauhey, Percy H. Physical implications of large-scale water transfers, in McGinnies and Goldman, *Arid Lands in Perspective,* U. of Arizona Press, (1968) pp. 358–363.

Nace, Raymond, Water in flatland, *Geo. Sci. News,* **1** (1), 2–5, 18–22 (1967).

Ortolano, Leonard, *Environmental assessments in water resources planning,* IIASA Task Force Meeting on Interregional Water Transfers, Laxenburg, (11–14 October 1977).

Radforth, Norman V. NAWAPA and Muskeg, in Royal Soc. of Canada, *Water Resources of Canada,* Univ. of Toronto Press, pp. 27–28, (1967).

Thomas, Gerald W. and Box, Thadis W. *Social and ecological implications of water importation into arid lands,* AAAS Symposium on Arid Lands, Dallas, Texas, pp. 363–374, processed, (1968).

Tinney, E. Roy, NAWAPA: A continental water scheme, Symposium on Engineering Aspects, *Bull. atom. Scient.*, **23,** 21–25 (September 1967).

Антонов, В. С. Многолетняя изменчвость стока—экологический критерий оценки допустимого изъятия вод из Северных и Сибриских рек, Сб. *Оценка возможных изменений режима низовьев и устьеы рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий,* Ленинград, (1976).

Antonov, V. S. Normal streamflow variation as an ecological criterion for assessing the permissible level of water withdrawal from Northern and Siberian rivers, *Otsenka Vozmozhnykh Izmeneniy Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy,* Leningrad, (1976).

Батраков, Ю. В. Изменения направления стока Сибирских рек и вращение Земли, *Астрономический журнал*, Т. **48,** № 5, (1971).
Batrakov, Yu. V. Variation in the direction of the flow of the Siberian rivers and the rotation of the earth, *Astr. Zh.* **48,** No. 5, (1971).
Бачурин, Г. В., Ильина, И. С., Михайлов, Ю. П., Петров, И. Б. и Широков, В. М. О влиянии переброски стока Сибирских рек на природу таежных геосистем, Сб. *Влияние перераспределения стока рек бассейна Оби на природу тайги Срединного региона,* Иркутск, (1975).
Bachurin, G. V., Ilina, I. S., Mikhaylov, Yu. P., Petrov, I. B. and Shirokov, V. M. The influence of the diversion of Siberian river flow on the environmental conditions of the taiga geosystems, *Vliyaniye Pererasрredeleniya Stoka rek Basseyna Obi na Prirodu Taygi Sredinnogo Regiona,* Irkutsk, (1975).
Братцев, А. П. Возможные изменения природных условий в нижнем течении Оби при переброске части ее стока в бассейн Волги, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий,* Ленинград, (1976).
Bratsev, A. P. Possible environmental changes in the lower reaches of the Ob River when part of its flow is diverted to the Volga Basin, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy,* Leningrad, (1976).
Братцев, А. П. Влияние переброски стока р. Печоры в бассейн р. Волги на природные условия и народное хозяйтво Коми АССР, *Серия научных докладов, АН СССР Коми Филиал,* вып. 26, (1976).
Bratsev, A. P. The influence of the diversion of the flow of the Pechora River to the Volga Basin on the environment and economy of the Komi ASSR, *Ser. Neuchnykh Dokl., AN SSSR Komi Fil.* issue 26, (1976).
Вендров, С. Л. Географические аспекты проблемы территориального перераспределения речного стока на Русской равнине, Сб. *Природные ресурсы Русской равнины и перспектива их использования,* Москва, (1974).
Vendrov, S. L. Geographical aspects of the problem of large-scale areal redistribution of streamflow on the Russian Plain, *Prirodnye Resursy Russkoy Ravniny i Perspektiva ikh ispolzovaniya,* Moskva, (1974).
Вендров, С. Л. О некоторых задачах географических наук в связи с проблемами водохозяйственного благоустройства, *Вопросы географии,* сб. **100,** (1976).
Vendrov, S. L. Some of the tasks facing geographical sciences in connection with the problems of water-resources development *Vop. Geogr.* **100,** (1976).
Вильнер, М. Я. Градостороительный аспект переброски части стока Сибирских рек в бассейн Аральского моря, Сб. *Опыт разработки и реализации схем и проектов районной планировки,* Киев, (1976).
Vilner, M. Ya. The urban aspect of the partial transfer of the flow of the Siberian rivers to the Aral Sea Basin, *Opyt Razrabotki i Realizatsii Skhem i Proektov Rayonnoy Planirovki,* Kiev, (1976).
Влияние межбассейнового перераспределения речного стока на природные условия Европейской территории и Срединного региона СССР, *Тезисы докладов Совещания,* Москва (1975).
The effects of inter-basin river flow redistribution on the environmental conditions of the european area and the centıal region of the USSR, *Tezisy Dokl. Soveshchaniya,* Moskva (1975).
Влияние перераспределения стока рек бассейна Оби на природу тайги Срединного региона, *Материалы совещания,* Иркутск (1975).
The effect of the streamflow redistribution of the Ob River on the tayga environment of the central region, *Mater. Soveshchaniya,* Irkutsk (1975).
Волков, И. А. Ландшафтные и геологогеоморфологические предпосылки решения проблемы переброски части стока Сибирских рек на юг, Сб. *Природно-мелиоративная характеристика Средней Азии и Казахстана,* Пущино, (1976).
Volkov, I. A. Environmental geological and geomorphological factors of the partial diversion of the Siberian rivers run-off to the south, *Prirodnomeliorativnaya Kharakteristika Sredney Azii i Kazakhstana,* Puschchino, (1976).
Воробьев, Б. В. Взаимосвязь экологических и экономических процессов при освоении водных ресурсов рек и озер, *Труды координационного совещания по гидротехнике,* вып. 102, (1975).
Vorobyev, B. V. The interaction of ecological and economic processes in developing the water resources of rivers and lakes, *Tr. Koord. Soveshch. Gidrotekh.,* issue 102, (1975).
Гаврилова, Л. А. Особенности метеорологического режима в низовьях и устьевой области реки Оби и пути оценки его возможных изменений под влиянием водохозяйственных мероприятий, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий,* Ленинград, (1976).
Gavrilova, L. A. Meteorological conditions in the lower and mouth areas of the Ob River and the methods of evaluating possible variations of these conditions due to water management activities, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniyem Vodokhozyaystvennykh Meropriyatiy,* Leningrad, (1976).

Герасимов, И. П. и Гиндин, А. М. *Проблемы переброски сибирских речных вод на пустынные равнины Средней Азии и Казахстана,* XXIII Международный Географический конгресс, Симпозиум "Человек и среда", Москва, (1976).

Gerasimov, I. P. and Gindin, A. M. *The problems of diversion of the Siberian river waters to the desert plains of Central Asia and Kazakhstan,* XXIII Mezhdunarodnyy Geograficheskii Kongress, Simpozium: Chelovek i Sreda, Moskva, (1976).

Городецкая, М. Е. Геоморфологические условия переброски части стока западносибирских рек в бассейн Сырдарьи, Сб. *Природно-мелиоративная характеристика Средней Азии и Казахстана,* Пущино, (1976).

Gorodetskaya, M. E. The geomorphological conditions of the partial diversion of the flow of the West Siberian rivers to the Syr-Darya River Basin, *Prirodno-meliorativnaya Kharakteristika Sredney Azii i Kazakhstana,* Pushchino, (1976).

Дмитриев, В. С., Пославский, В. В. и Решёткина, Н. М. Мелиоративные прогнозы – основа выбора технических решений при переброске части стока северных рек на юг, *Водные ресурсы,* № 5, (1977).

Dmitriev, V. S., Poslavskii, V. V. and Reshetkina, N. M. Reclamation forecasts as the basis to selecting technological schemes to transfer some part of runoff of northern rivers to the south, *Vodn. Resur.*, No. 5, (1977).

Дроздов, О. А., Сорочан, О. Г. и Шикломанов, И. А. Предварительная оценка возможных изменений глобального влагооборота под влиянием хозяйственной деятельности, *Водные ресурсы,* № 6, (1976).

Drozdov, O. A., Sorochan, O. G. and Shiklomanov, I. A. Preliminary estimation of probable changes in global water circulation under the effect of economic activities, *Vodn. Resur.* No. 6, (1976).

Зарубаев, Н. В. Вопросы охраны окружающей среды в зонах межбассейнового перераспределения речного стока, *Труды Ленинградского Политехнического института,* № **351,** (1976).

Zarubaev, N. V. Environmental protection problems in inter-basin river flow redistribution zones, *Tr. Leningr. Politekh. Inst.*, No. **351,** (1976).

Катков, Н. С. и Новицкий, О. П. Рыбное хозяйство Обь–Иртышского бассейна в условиях отбора части стока для переброски в бассейн Аральского моря. Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под вкиянием водохозяйственных мероприятий,* Ленинград, (1976).

Katkov, N. S. and Novitskiy, O. P. Fishing practices in the Ob–Irtysh Basin with part of the flow removed for conveyance to the Aral Sea Basin, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizobyev i Ustiev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy,* Leningrad, (1976).

Кесь, А. С. и Грязнова, Т. П. Геоморфологические условия зоны переброски части стока Сибирских рек на междуречье низовий Сырдарьи – Амударьи, Сб. *Природно-мелиоративная характеристика Средней Азии и Казахстана,* Пущино, (1976).

Kes, A. S. and Gryaznova, T. P. Regional geomorphological conditions divert part of the flow of the Siberian Rivers to the Syrdarya–Amudarya lower reaches interfluve area, *Prirodnomeliorativnaya Kharakteristika Sredney Azii i Kazakhstana,* Pushchino, (1976).

Макеев, О. В. и Чигир, В. Г. Переброска части речного стока северных рек на юг и её возможное влияние на мерзлотные условия в лесной зоне Западной Сибири, Сб. *Влияние перераспределения стока рек бассейна Оби на природу тайги Срединного региона,* Иркутск (1975).

Makeev, O. V. and Chigir, V. G. The partial diversion of the flow of the northern rivers southward and its possible effect on the permafrost in the forest zone of West Siberia, *Vliyaniye Pereraspredeleniya Stoka rek Basseyna Obi na Prirodu Taygi Sredinnogo Regiona,* Irkutsk, (1975).

Мартынов, А. В. К оценке изменения природных условий в результате переброски части стока сибирских рек, Сб. *Изучение природы, хозяйства и населения Сибири,* Иркутск, (1975).

Martynov, A. V. Evaluating the environmental changes due to the partial diversion of the flow of the Siberian rivers, *Izucheniye Prirody, Khozyaystva i Naseleniya Sibiri,* Irkutsk, (1975).

Мелиорация почв Средней Азии, Казахстана и Западной Сибири в связи с переброской части стока Сибирских рек в южные районы страны, *Тезисы докладов совещания,* Пущино (1973).

Soil reclamation in Central Asia, Kazakhstan and West Siberia in connection with the partial diversion of the flow of the siberian rivers to the country's southern Areas, *Tezisy Dokl. Soveshchaniya,* Pushchino, (1973).

Михайлов, Н. И. Проблемы перераспределения стока рек Срединного района СССР, *Вестник МГУ, серия У – География,* № 6, (1974).

Mikhaylov, N. I. The problems of river flow redistribution in the USSR central region, *Vest. mosk. gos. Univ., ser. V-Geogr.*, No. 6, (1974).

Михайлов, Н. И. Естественные тенденции развития ландшафтов Западной Сибири и возможные изменения их в связи с проблемами перераспреденелия стока, Сб. *География и хозяйство Красноярского края,* Красноярск, (1975).

Mikhaylov, N. I. Natural landscape development trends in West Siberia and their possible changes in connection with the problems of streamflow reallocation, *Geografiya i Khozyaystvo Krasnoyarskogo Kraya,* Krasnoyarsk, (1975).

Михайлов, Н. И., Криволуцкий, А. Е., Николаев, В. А., Скорняков, В. А. и Тимашев, И. Е. *Прогноз физико-географических следствий переброски части стока Сибирских рек на юг,* XXIII Международный Географический конгресс, Секция "Общая физическая география", Москва, (1976).

Mikhaylov, N. I., Krivolutskiy, A. E., Nikolaev, V. A., Skornyakov, V. A. and Timashev, I. E. *Forecasting the environmental consequences of the partial diversion of the flow of the Siberian rivers to the south,* XXIII Mezhdunarodnyi Geograficheskiy Kongress, Sektsiya, Obshchaya Fizicheskaya Geografiya, Moskva, (1976).

Михайлов, Ю. П. Влияние переброски речного стока северных рек на природу таёжных геосистем, *Известия Всесоюзного Географического общества,* т. **107,** вып. 1, (1975).

Mikhaylov, Yu. P. The influence of the diversion of the northern rivers flow on the taiga geosystems, *Izv. Vses. Geogr. Obshchestva,* **107,** (1), (1975).

Михайлов, Ю. П. Географические аспекты охраны природы Обского Севера в связи с перераспределением стока Оби и Иртыша, Сб. *Влияние перераспределения стока рек бассейна Оби на природу тайги Срединного региона,* Иркутск, (1975).

Mikhaylov, Yu. P. Geographical aspects of the environmental protection of the Ob northern area in connection with the redistribution of the flow of the Ob and the Irtysh, *Vliyaniye Pereaspredeleniya Stoka rek Basseyna Obi na Prirodu Taygi Sredinnogo Regiona,* Irkutsk, (1975).

Никонов, С. П. Перспективы развития рыбного хозяйства Обь–Иртышского бассейна при условии отбора части его стока, Сб. *Влияние перераспределения стока рек бассейна Оби на природу тайги Срединного региона,* Иркутск, (1975).

Nikonov, S. P. The prospects of development of the fishing in the Ob–Irtysh Basin with part of its flow withdrawn, *Vliyaniye Pereraspredeleniya Stoka rek Basseina Obi na Prirodu Taygi Sredinnogo Regiona,* Irkutsk, (1975).

Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий, Тезисы Докладов, Ленинград (1976).

Evaluating possible variations of the regime in the lower and mouth reaches of the arctic rivers of west Siberia under the influence of water management activities, *Tezisy Dokl.* Leningrad (1976).

Ретеюм, А. Ю. *Географические вопросы проектирования и прогнозирования в разработке планов переброски стока рек Европейского Севера,* Материалы III Всесоюзного совещания по прикладной географии, Иркутск, (1975).

Reteyum, A. Yu. *Geographical questions of planning and forecasting in working out schemes of streamflow diversion of the rivers of the northern European part of the USSR,* Materialy III Vsesoyuznogo Soveshchaniya po Prikladnoy Geografii, Irkytsk, (1975).

Степанов, И. Н. и Озерова, Е. Н. Возможные изменения природно-мелиоративных условий Срединного региона СССР в связи с переброской стока Сибирских рек на юг страны, Сб. *Природно-мелиоративная характеристика Средней Азии и Казахстана,* Пущино, (1976).

Stepanov, I. N. and Ozerova, E. N. Possible changes in the environmental and meliorative conditions of the USSR Central Region in connection with the diversion of the flow of the Siberian rivers to the south, *Prirodnomeliorativnaya Kharakteristika Sredney Azii i Kazakhstana,* Pushchino, (1976).

Трешников, А. Ф. Задачи изучения природы Арктики в связи с частичныи изъятием стока северных и сибирских рек, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий,* Ленинград, (1976).

Treshnikov, A. F. Objectives for the study of the arctic environment in connection with partical withdrawal of runoff from northern and Siberian rivers, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustiev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy,* Leningrad, (1976).

Ходжибаев, Н. Н. *Прогноз изменения гидрогеолого–мелиоративных условий территории Средней Азии, затрагиваемых межбассейновыми перебросками рек,* Международный Геологический конгресс, XXУ сессия, Москва, (1976).

Khodzhibaev, N. N. *Forecasting the changes of hydrogeological and reclamative conditions in the area of Central Asia involved in inter-basin streamflow transfer,* Mezhdunarodnyi Geologicheskiy Kongress, XXV Sessiya, Moskva, (1976).

Ходжибаев, Н. Н., Арипов, К. М., Чеботарёва, Г. Б., Магднев, В. У. и Рахимов, М. Р. К вопросу изменения гидрогеолого–мелиоративных условий территории Средней Азии в связи с межбассейновыми перебросками стока, Сб. *Вопросы изучения и прогноза режима и баланса грунтовых вод орошаемых земель аридной зоны СССР,* Ташкент, (1975).

Khodzibaev, N. N., Aripov, K. M., Chebotareva, G. B., Magdnev, V. U. and Rakhimov, M. R. Changes in the hydrogeological and reclamative conditions of the area of Central Asia in connection with inter-basin streamflow transfer, *Voprosy Izucheniya i Prognoza Rezhima i Balansa Gruntovykh vod Orashaemykh Zemel Aridnoy Zony SSSR,* Tashkent, (1975).

HYDROLOGICAL ASPECTS

Ackerman, William C. *Water transfers—possible de-eutrophication of the Great Lakes,* Natural Research Council, 25 pp. Proc., (11 March 1968).

Dutton, R. D. and Millham, C. B. On large diversions from the Northwest–normal and high flow years, *Water Resour. Bull.*, **9,** 231–242 (1973).

Kirshner, Louis D. *Effects of diversions on the Great Lakes,* Proc. Great Lakes Water Resources Conf., Paper R-4, pp. 277–310 (1968).

Laing, Arthur, *Great Lakes Water Levels,* Brochure: Dept of Northern Affairs and National Resources, Water Resources Branch, 14 pp. (1964).

Meserow, Albert J. *Great Lakes water—Is there enough?* Proc. 1st Am. Water Resources Ass. Conf., pp. 365–371 (1965).

Odom, Leo M. Atchafalaya diversion and its effect on the Mississippi River, *Trans. Am. Soc. civ. Engrs,* **116,** 503–547 (1951).

Salisbury, E. F. Influence of diversion on the Mississippi and Archafalaya Rivers, *Trans. Am. Soc. civ. Engrs,* **102,** 75–103, Disc: Odom, Leo M., Lane, E. W. and Salisbury, E. F. **102,** 103–122 (1937).

White, W. A., Tischler, L. F. and Austin, T. A. Water quality prediction within an inter-basin transfer system, *Water Resour. Bull.*, **8** (3), (June 1972).

Yantis, Hugh C. *Water quality considerations,* Symposium on Aspects of the Diversion of Mississippi River Water to Texas and New Mexico, pp. 30–37 (1969).

Антонов, В. С. К проблеме безвозвратного изъятия части стока северных рек, *Труды Арктического и Антарктического научно-исследовательского института,* т. **323,** Ленинград (1976).

Antonov, V. S. The problem of irretrievable removal of part of the flow of the northern rivers, *Tr. arkt. antark. nauchno-Issled. Inst.*, **323,** Leningrad (1976).

Архипова, Е. Г. Современный и перспективный водный и солевой баланс и возможные изменения гидрологического режима Каспийского моря, *Труды ВНИИ морского рыбного хозяйства и океанографии,* вып. **108,** (1975).

Arhipova, E. G. Present and expected water and salt balance and possible changes of hydrologic regimen of the Caspian Sea, *Tr. vses. nauchno-issled. Inst. morsk. ryb. Khoz. Okaenogr.*, **108,** (1975).

Баранов, В. А., Бочков, Н. М. и Мясникова, Е. В. Основные черты прогноза изменения качества воды в бассейнах р. Волги и Аральского моря при переброске в них части стока северных и сибирских рек, *Труды IУ Всесоюзного Гидрологического съезда,* т. **9,** Ленинград (1976).

Baranov, V. A., Bochkov, N. M. and Myasnikova, E. V. The basic characteristics of prediction of water quality variations in the basins of the Volga and the Aral Sea on diverting part of the flow of the northern and Siberian rivers, *Tr. IV Vses. Gidrol. S"êzda,* **9,** Leningrad (1976).

Бейром, С. Г. и Широков, В. М. Предполагаемые изменения гидрологических и гидрогеологических условий в земельном фонде Сибири при переброске стока рек в Среднюю Азию, *Земельные ресурсы Сибири,* Новосибирск (1975).

Beyrom, S. G. and Shirokov, V. M. Likely changes in the hydrological and hydrogeological conditions of lands of Siberia on diversion of river flow to Central Asia, *Zemelnye Resur. Sibiri,* Novosibirsk (1975).

Бронфман, А. М. Некоторые океанологические и водохозяйственные аспекты компенсирующей переброски стока в бассейн Азовского моря, *Географические исследования на Северном Кавказе и Нижнем Дону,* Ростов-на Дону, (1973).

Bronfman, A. M. Some oceanological and water management aspects of the compensating streamflow diversion to the Basin of the Azov Sea, *Geograficheskiye Issledovaniya na Severnom Kavkaze i Nizhnem Donu,* Rostov-na-Donu, (1973).

Вельнер, Х. А. и Каск, А. Г. Об определении величины остаточного расхода воды при переброске стока, *Труды Всесеюзного научно-технического совещания "Разработка и организация водоохранных мероприятий",* Харьков, (1973).

Velner, Kh. A. and Kask, A. G. Determination of the residual water discharge rate in case of streamflow transfer, *Trudy Vsesoyuznogo Nauchno-Tekhnicheskogo Soveshchaniya "Razrabotka i Organizatsiya Vodookhrannykh Meropriyatiy",* Kharkov, (1973).

Вендров, С. Л. Проблемы территориального перераспределения речного стока, *Изв. АН СССР, серия Географ,* № 1, (1975).

Vendrov, S. L. The problems of large-scale areal redistribution of river flow, *Izv. AN SSSR, Ser. Geogr.* No. 1, (1975).

Вендров, С. Л. Использование и преобразование рек, Сб. *Природные ресурсы Русской равнины в прошлом, настоящем и будущем,* Москва, (1976).

Vendrov, S. L. The utilization and remaking of rivers, *Prirodnye Resursy Russkoy Ravniny v Proshlom, Nastoyashchem i Budushchem,* Moskva, (1976).

Вендров, С. Л. и Комлев, А. М. Состояние и перспективы иучения водных ресурсов Западной Сибири в связи с их народохозяйственным использованием, *Труды Западно-Сибирского регионального научно-исследовательского гидрометеорологического института*, вып. 26, (1976).

Vendrov, S. L. and Komlev, A. M. The state and prospects of water resources research for West Siberia in connection with water resources economic utilization, *Tr. Zapadno-Sib. Reg. Nauchno-Issled. Gidrometeorol. Inst.*, issue 26, (1976).

Герарди, И. А., Харченко, С. И. и Роо, С. С. Гидрологические проблемы переброски части стока северных и сибирских рек на южный склон СССР, *Труды IУ Всесоюзного Гидрологического съезда*, т. **4**, Ленинград (1976).

Gerardi, I. A., Kharchenko, S. I. and Roo, S. S. Hydrological problems of the partial diversion of the flow of the Northern and Siberian Rivers to the Southern Slope of the USSR, *Tr. IV Vses. Gidrol. S"êzda*, **4**, Leningrad (1976).

Гришанин, К. В. Возможные изменения режима низовьев Оби при частичном отъёме стока, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влием водохозяйственных мероприятий*, Ленинград, (1976).

Grishanin, K. V. Possible changes in the regimen of the lower reaches of the Ob River in case of partial flow withdrawal, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyov i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennoykh Meropyatiy*, Leningrad, (1976).

Донченко, Р. В. Оценка изменеий характеристик ледового режима рек Оби и Иртыша в связи с переброской их стока, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий*, Ленинград, (1976).

Donchenko, R. V. Evaluating the changes in the characteristics of the ice conditions of the Ob and the Irtysh Rivers in connection with the transfer of their flow, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy*, Leningrad, (1976).

Донченко, Р. В., Маркова, О. Л., Охинченко, А. И., Попов, И. В., Скальский, Б. Г. и Сорочан, О. Г. Исследования возможных последствий территориального перераспределения водных ресурсов, *Водные ресурсы*, № 1, (1977).

Donchenko, R. V., Markova, O. L., Okhinchenko, A. I., Popov, I. V., Skalskiy, B. G. and Sorochan, O. G. Studies of large-scale areal water resources redistribution, *Vodn. Resur.* No. 1, (1977).

Дроздов, О. А., Сорочан, О. Г., Маркова, О. Л., Охинченко, А. И., Бурова, Л. П. и Воскресенский, А. И. Возможные изменения элементов гидрологичесного цикла в северной части бассейна Оби под влиянием переброски стока, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий*, Ленинград, (1976).

Drozdov, O. A., Sorochan, O. G., Markova, O. L., Okhinchenko, A. I., Burova, L. P. and Voskresenskiy, A. I. Possible changes in the elements of the hydrological cycle in the northern part of the Ob Basin under the influence of streamflow transfer, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniyem Vodokhozyaystvennykh Meropriyatiy*, Leningrad, (1976).

Захаров, В. П. и Калачев, Н. С. Проблема территориального перераспрелеления водных ресурсов Срединного региона СССР, *Комплексное использование водных ресурсов Сибири и Дальнего Востока и их охрана*, Омск, (1969).

Zakharov, V. P. and Kalchev, N. S. The problem of water resources areal redistribution in the USSR Central Region, *Kompleksnoye Ispolzovaniye Vodnykh Resursov Sibiri i Dalnego Vostoka i ikh Okhrana*, Omsk, (1969).

Иванов, В. В. и Налимов, Ю. В. Состояние и перспективы изучения устьевых областей рек Западной Сибири для оценки возможных изменений их режима под влиянием водохозяйственных мероприятйи, *Труды Западно-Сибирского регионального научно-исследовательского гидрометеорологического института*, вып. 26, (1976).

Ivanov, V. V. and Nalimov, Yu. V. The present state and prospects of investigating the mouth areas of the West Siberian rivers to determine possible changes in their regimen under the influence of water management activities, *Tr. Zapadno-Sib. Reg. Naucho-Issled. Gidrometeorol. Inst.*, issue 26, (1976).

Иванов, М. С., Свашенко, Л. С. и Стольберг, Ф. В. Защита от истощения и регулирование качества поверхностных и подземных вод при осуществлении крупных межбассейновых перебросок, Сб. *Проблемы охраны и использования вод*, вып. 2, (1973).

Ivanov, M. S., Svashenko, L. S. and Stolberg, F. V. Quality control of surface and underground waters on transfer of large amounts of flow between basins, *Probl. Okhr. Ispolzovaniya Vod*, issue 2, (1973).

Иванов, М. С. и Стольберг, Ф. В. Вопросы охраны вод при межбассейновых перебросках стока, *Труды Всесоюзного совещания по охране вод*, Харьков (1973).

Ivanov, M. S. and Stolberg, F. V. The problems of water protection in case of inter-basin streamflow transfer, *Tr. Vses. Soveshch. Okhr. Vod*, Kharkov (1973).

Исмайылов, Г. Х. и Голубаш, Т. Ю. Учет межзональной и внутризональной асинхронности стока бассейнов рек Европейской территории Союза в связи с намечаемыми перебросками стока северных рек, Сб. *Комплексное использование водных ресурсов,* Минск (1975).

Ismaylov, G. Kh. and Golubash, T. Yu. Consideration of the inter-zonal and inside-zonal asynchronism in the flow from the river basins of the USSR European area in connection with the planned diversion of the flow of the northern rivers, *Kompleksnoye Ispolzovaniye Vodnykh Resursov,* Minsk, (1975).

Калинии, Г. П., Быков, В. Д., Евсеева, Л. С. и Попов, Л. И. Водные ресурсы СССР и их перераспределение для нужд народного хозяйства, Сб. *Взаимодействие поверхностного и подземного стока,* вып. 2, МГУ, Москва, (1974).

Kalinin, G. P., Bykov, V. D., Evseeva, L. S. and Popov, L. I. Water resources of the USSR and their reallocation for the needs of national economy, *Vzaimodeistvie Poverhnostnogo i Podzemnogo Stoka,* issue 2, Moscow State University, Moskva, (1974).

Карасев, И. Ф. *Русловые процессы при переброске стока,* Ленинград, (1970).

Karasev, I. F. *River Channel Processes on Streamflow Transfer,* Leningrad, (1970).

Карасев, И. Ф. Особенности русловых процессов при переброске стока, *Труды IУ Всесоюзного Гидрологического Съезда,* т. **10**, Ленинград (1976).

Karasev, I. F. The characteristics of river-bed processes in case of streamflow transfer, *Tr. Vses. Gidrol. S"êzda,* **10,** Leningrad (1976).

Комлев, А. М. и Вострякова, Н. В. Некоторые аспекты гидрологических проблем в связи с переброской части стока сибирских рек на юг, Сб. *Влияние перераспределения смока рек бассейна Оби на природу тайги Срединного региона,* Иркутск, (1975).

Komlev, A. M. and Vostryakova, N. V. Some aspects of the hydrological problems in connection with the diversion of part of the flow of the Siberian rivers southward, *Vliyaniye Pereraspredeleniya Stoke rek Basseyna Obi na Prirodu Taygi Sredinnogo Regiona,* Irkutsk, (1975).

Кузьмин, И. А. и Викулова, Л. И. Проблемы русловых процессов при переброске стока, *Водные ресурсы,* № 3, (1974).

Kuzmin, I. A. and Vikulova, L. I. The river-bed process problems in transferring river flow, *Vodn. Resur.* No. 3, (1974).

Львович, М. И. Географические аспекты территориального перераспределения водных ресурсов, *Изв. АН СССР, серия географ.,* № **2,** (1977).

Lvovich, M. I. Geographical aspects of the large-scale reallocation of water resources, *Izv. AN SSSR, Ser. Geogr.,* No. 2, (1977).

Малик, Л. К. Об изменении некоторых элементов режима рек Нижней Оби при регулировании стока (в сявзи с проблемой перераспределения водных ресурсов в Срединном регионе), *Вестник МГУ, серия У – География,* № 1, (1975).

Malik, L. K. Variation of some elements of the regimen of the rivers of the Lower Ob area on streamflow regulation in connection with the water redistribution problem in the Central Region, *Vest. mosk. gos. Univ., ser. V-Geogr.,* 1, (1975).

Малик, Л. К. Гидрологические проблемы таежных районов Запедной Сибири в связи с перераспределением водных ресурсов в Срединном регионе, Сб. *Влияние перераспределения стока рек бассейна Оби на природу тайги Срединного региона,* Иркутск, (1975).

Malik, L. K. Hydrological problems of the West Siberia taiga regions in connection with watei resources redistribution in the USSR central region, *Vliyaniye Pereraspredeleniya Stoka rek Basseyna Obi na Prirodu Taygi Sredinnogo Regiona,* Irkutsk, (1975).

Малик, Л. К. *Разработка модели оптимального режима рек переувлажненных зон Западной Сибири в связи с проблемами мелиорации территории и межзонального перераспределения водных ресурсов,* XXIII Международный Географический конгресс, Симпозиум "Преобразование водного баланса под влиянием хозяйственной деятельности", Ленинград, (1976).

Malik, L. K. *The development of an optimum regimen model for the rivers of the west Siberia's over-humid zones in connection with the soil improvement and inter-zonal water resources redistribution problems,* XXIII Mezhdunarodnyi Geograficheskiy Kongress, Simpozium, Preobrazovaniye Vodnogo Balansa pod Vliyaniem Khozyaystvennoy Deyatelnosti, Leningrad, (1976).

Малик, Л. К. Гидрологический аспект проблемы преобразования природы Западно-Сибирской равнины, *Водные ресурсы,* № 3, (1976).

Malik, L. K. The hydrological aspect of the environment remaking problem for the west Siberian plain, *Vodn. Resur.* No. 3, (1976).

Малик, Л. К. Изменение режима подпоров на притоках низовьев Оби при регулировании стока, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий,* Ленинград, (1976).

Malik, L. K. Change in backwater regimen on the Lower Ob Tributaries under runoff regulation conditions, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy*, Leningrand, (1976).

Маркова, О. Л., Охинченко, А. И. и Сорочан, О. Г. *Изменение водного баланса влагооборота и гидрологичесного режима рек под влиянием межзонального перераспределения водных ресурсов*, XXIII Международный Географический конгресс, Симпозиум "Преобразование водного баланса под влиянием хозяйственной деятельности", Ленинград, (1976).

Markova, O. L., Okhinchenko, A. I. and Sorochan, O. G. *Variation of the water balance of the water cycle and the hydrological conditions of rivers under the influence of inter-zonal water resources redistribution*, XXIII Mezhdunarodnyi Geograficheskii Kongress, Simpozium "Preobrazovaniye Vodnogo Balansa pod Vliyaniyem Khozyaystvennoy Deyatelnosti", Leningrad, (1976).

Марти, Ю. Ю. и Раткович, Д. Я. Водохозяйственные проблемы Азовского и Каспийского морей, *Водные ресурсы*, № 3, (1976).

Marti, Yu. Yu. and Ratkovich, D. Ja. Water management problems of the Sea of Azov and the Caspian Sea, *Vodn. Resur.* No. 3, (1976).

Мезенцев, В. С. О вероятных направлениях и размерах влияния перебросок части стока сибирских рек на гидролого-климатические условия лесной зоны Западной Сибири, Сб. *Природные условия Западной Сибири и переброска стока рек в Среднюю Азию*, Новосибирск, (1975).

Mezentsev, V. S. On possible impacts due to partial transfer to the flow of the Siberian rivers on hydrological and climatic conditions of the forest zone of West Siberia, *Prirodnye Usloviya Zapadnoy Sibiri i Perebroska Stoka rek v Srednyuyu Aziyu*, Novosibirsk, (1975).

Мезенцев, В. С. Вероятное влияние переброски части стока Оби и Иртыша на увлажненность лесной зоны, *Труды Омского сельскохозяйственного института*, **151**, (1976).

Mesentsev, V. S. The most likely effect of the partial transfer of the Ob and the Irtysh runoff on the precipitation–evaporation difference in the forest zone, *Tr. omsk. Sel'-khoz. Inst.*, **151**, (1976).

Мезенцев, В. С. О вероятных размерах изменения воднобалансовых элементов в зонах изъятия и распределения стока сибирских рек, *Труды Омского сельскохозяйственног института*, **151**, (1976).

Mezentsev, V. S. The most likely dimensions of changes in water balance components in the flow withdrawal and distribution zones of the Siberian rivers, *Tr. omsk. Sel'-khoz. Inst.* **151**, (1976).

Мезенцев, В. С. *О вероятных изменениях водного баланса Срединного региона СССР под влиянием межзонального перераспределения стока сибирских рек с целью гидротехнических мелиораций*, XXIII Мехдународный Географический конгресс, Симпозиум "Преобразование водного баланса под влиянием хозяйственной деятельности", Ленинград, (1976).

Mezentsev, V. S. *Possible changes in the water balance of the USSR central region under the influence of the inter-zonal transfer of the flow of the Siberian rivers for reclamation*, XXIII Mezhdunarodnyi Geograficheskiy Kongress, Simpozium, Preobrazovaniye Vodnogo Balansa pod Vliyaniyem Khozyaystvennoy Deyatelnosti, Leningrad, (1976).

Мезенцев, В. С. Вероятные изменения водного баланса под влиянием межзонального перераспределения стока сибирских рек, *Водные ресурсы*, № 1, (1977).

Mezentsev, V. S. Likely changes in the water balance under the influence of the inter-zonal redistribution of the Siberian river flow, *Vodn. Resur.*, No. 1, (1977).

Михайлов, В. Н., Рогов, М. М., Ган, Г. Н., Макарова, Т. А. и Полонский, В. Ф. Изменения гидролого–морфологических процессов в устьях рек под влиянием водохозяйственных мероприятий и некоторые методы их расчета, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий*, Ленинград, (1976).

Mikhaylov, V. N., Rogov, M. M., Gan, G. N., Makarova, T. A. and Polonskiy, V. F. Variations of hydrological and morphological processes in the river mouth areas due to water utilization activities and some methods of estimating such variations, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniyem Vodokhozyaystvennykh Meropriyatiy*, Leningrad, (1976).

Николаев, И. И. Происходящне и ожидаемые изменения в экологии озёр Северо—Запада СССР, *Водные ресурсы*, № 6, (1977).

Nikolaev, I. I. Occurring and expected variations in the lake ecology of the USSR north west, *Vodn. Resur.* No. 6, (1977).

Новиков, С. М. Возможные изменения воднотеплового режима болот Северной части Западной Сибири под влиянием хозяйственной деятельности, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий*, Ленинград, (1976).

Novikov, S. M. Possible changes in the water and heat conditions of the marshes of the northern part of West Siberia under the influence of economic activity, *Otsenka Vozmozhnykh Izmeneniy Rezhimov Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy*, Leningrad, (1976).

Скорняков, В. А. Корроляционная связь колебаний годового стока рек Срединного региона, *Водные ресурсы*, № 5, (1975).

Skornyakov, V. A. Correlative relationship between annual variations in the river flow of the USSR central region, *Vodn. Resur.*, No. 5, (1975).

Скорняков, В. А. О возможном изменении высоты половодья и условий затопления поймы в нижних бьефах гидроузлов на Средней Оби и Нижнем Иртыше, *Водные ресурсы*, № 3, (1976).

Skornyakov, V. A. On possible changes in the flood level downstream hydraulic complexes at the Middle Ob and the Lower Irtysh, *Vodn. Resur.*, No. 3, (1976).

Чембарисов, Э. И. К решению гидрохимических задач в связи с переброской части стока Сибирских рек на юг страны, Сб. *Природно-мелиоративная характеристика Средней Азии и Казахстана*, Пущино, (1976).

Chembarisov, E. I. The solution of hydrochemical problems in connection with the diversion of part of the flow of the Siberian Rivers to the South of the USSR, *Prirodno-Meliorativnaya Kharakteristika Sredney Azii i Kazakhstana*, Pushchino, (1976).

Черненко, И. М. Переброска части стока сибирских рек на юг и оптимальные условия сохранения Арала, *Проблемы освоения пустынь*, № 6, (1972).

Chernenko, I. M. Partial diversion of the flow of the Siberian Rivers to the South and the optimum conditions to protect the Aral Sea, *Probl. Osvoeniya Pustyn*, No. 6, (1972).

Широков, В. М. Перераспределение твердого стока Оби после переброски части её вод в Среднюю Азию, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием водохозяйственных мероприятий*, Ленинград, (1976).

Shirokov, V. M. Change in sediment transport in Ob River due to partial transfer of its runoff to Central Asia, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy*, Leningrad, (1976).

Шпайхер, А. О., Морецкий, В. Н. и Никифоров, Е. Г. Океанографический режим Северного Ледовитого океана и проблема перераспределения стока рек его бассейна, Сб. *Оценка возможных изменений режима низовьев и устьев рек Арктической зоны Западной Сибири под влиянием Водохозяйственных мероприятий*, Ленинград, (1976).

Shpaykher, A. O., Moretskiy, V. N. and Nikiforov, E. G. The oceanographical regimen of the Arctic Ocean and the problem of river flow redistribution in its basin, *Otsenka Vozmozhnykh Izmeneniy Rezhima Nizovyev i Ustyev rek Arkticheskoy Zony Zapadnoy Sibiri pod Vliyaniem Vodokhozyaystvennykh Meropriyatiy*, Leninegard, (1976).

TECHNOLOGY

Anon., *Operating principles: Fryingpan-Arkensas project*, 87th Congr., 1st Session, House Doc. 130, 7 pp. (1961).

Burkholder, J. L. Colorado River aqueduct tunnels, *Civ. Engng*, **5**, 524–527, Disc: Agnew, J. Carson, **5**, 643 (1935).

Christensen, N. A. *et al.*, *Economic analysis of large water systems*, Cornell Univ. Water Resources Publn, No. 22, 98 pp. (1969).

Christensen, B. A. and Bush, Peter W. Optimum design of inter-basin tunnel systems, *Water Resour. Bull.*, **7**, 273–284 (1971).

Dann, H. E., Hartwig, W. P. and Hunter, J. R. Unlined tunnels of the Snowy Mountains Hydro-Electric Authority, Australia, *Proc. Am. Soc. civ. Engrs*, **90** (PO3), 47–49, Disc: **91** (PO1), 118–124; **92** (PO1), 125–129 (1964).

Delord, Pierre, Quelques ouvrages originaux du canal principal d'irrigation du Bas Rhone– Languedoc (Some Innovations of the Main Irrigation Canal of the Bas Rhone-Languedoc Project), *Travaux*, **49**, 87–96 (1965).

Golze, Alfred R. Use of pipelines in the California Water Project, *Proc. Am. Soc. civ. Engrs*, **93** (PL-3), 25–32, Disc: **94** (PL-1), 198–199 (1967).

Gumensky, D. B. The Colorado River Aqueduct: Governing factors in aqueduct design, *Engng News Rec.* **121,** 653–658 (1938).

Halwani, Salah, Janod, Albert, and Lajeat, J. P. Le percement du tunnel d'Avali de l'amenagement du Litani au Liban (The driving of the Awali Tunnel of the development of the Litani in Lebanon), *Travaux*, **49,** 247–260 (1965).

Hinds, Julian, Large delivery lines for the Colorado River Aqueduct System, *Civ. Engng*, **8**, 469–472 (1938).

Hinds, Julian, The Colorado River Aqueduct, major problems of aqueduct location, *Engng News Rec.*, **121,** 646–652 (1838).

Howson, Louis R. Factors affecting long-distance transmission of water, *J. Am. Wat. Wks Ass.*, **49,** 1359–1368 (1957).

Hunter, J. R. and Hartwig, W. P. The design and construction of the Tooma–Tumut project of the Snowy Mountains Scheme, *J. Instn Engrs Aust.*, **34,** 163–185 (1962).

Klingeman, Peter C. *Engineering aspects of diversion proposals,* Symposium on Northwest–Southwest Water Diversion Issues, Oregon State Univ., pp. 11–30 (1967).

Linaweaver, F. P. Jr and Clark, C. Scott, Costs of water transmission, *J. Am. Wat. Wks Ass.*, **56,** 1549–1560 (1964).

Miller, David R. and Miller, James P. Optimizing conveyance systems for water transmission, (1) Am. Soc. Civ. Engrs National Convention, Meeting reprint 603, San Diego, CA, 28 pp; (2) *Civ. Engng,* **38,** 38–41 (July 1968).

Resnick, Sol, Large-scale transfers of water and alternatives, in McGinnes and Goldman, *Arid Lands in Perspective,* U. of Arizona Press, (1968) pp. 418–421.

Reynolds, Robin R. and Madsen, Welby R. Automation in California's State Water Project, *Proc. Am. Soc. civ. Engrs,* **93** (PL-3), 15–23, Disc: **94** (PL-1), 196–198 (1967).

Socha, Max K. Construction of the second Los Angeles aqueduct, *J. Am. Wat. Wks Ass.,* **57,** 699–706 1965).

Tinney, E. R. Engineering aspects (of NAWAPA), *Bull. atom. Scient.*, **23,** 21–25 (September 1967).

Weymouth, F. E. Tunnel construction—Colorado River Aqueduct, *Civ. Engng,* **4,** 240–244 (1934).

Wineland, J. A. and Lucas, C. V. *Economic comparison of canal linings for the California Aqueduct,* Proc. Seepage Symposium, Phoenix, Arizona, USDA-ARS, pp. 41–90, (19–21 February 1963).

Young, Gale, *Import alternatives, reuse, desalination and rain-making are discussed,* AAAS Symposium on Arid Lands, Dallas, pp. 382–397 (31 December 1968).

Альхименко, А. И., Ермаков, В. С. и Симаков, Г. В. О воздействии ветровых волн на откосы главного канала переброски, *Труды Ленинградского Политехнического института,* № **351,** (1976).

Alkhimenko, A. I., Ermakov, V. S. and Simakov, G. V. The effects of wind waves on the slopes of the main diversion canal, *Tr. Leningr. Politekh. Inst.*, No. **351,** (1976).

Бусалаев, И. В., Павленко, В. П. и Сергеева, Л. В. Экономико–математическая модель оптимизации схемы преодоления водораздела при межбассейновых перебросках стока, Сб. *Проблемы гидроэнергетики и водного хозяйства,* вып. 10, (1973).

Busalaev, I. V., Pavlenko, V. P. and Sergeeva, L. V. An economic and mathematical model of optimization for watershed divide passing schemes in case of inter-basin flow transfers, *Probl. Gidroenerg. Vodn. Khoz.*, Issue 10, (1973).

Васильев, Ю. С., Лойцянская, И. Л. и Шарыгин, В. С. Исследования эффективности насосных станций с обратимыми агрегатами при региональной переброске стока, *Труды Ленинградского Политехнического института,* № **351,** (1976).

Vasilyev, Yu. S., Loytsyanskaya, I. L. and Sharygin, V. S. Studies of the effectiveness of reversible-unit pumping stations during interregional flow transfer, *Tr. Leningr. Politekh. Inst.*, No. **351,** (1976).

Дмитриев, Г. С. К вопросу о переброске стока при гидроэнергетическом стороительстве, Сб. *Вопросы энергетики Кольского полуострова,* Апатиты, (1975).

Dmitriev, G. S. On the problem of streamflow transfer in connection with hydropower construction, *Voprosy Energetiki Kolskogo Poluostrova,* Apatity, (1975).

Замахаев, В. С., Мизинов, П. И. и Шкундин, Б. М. Пути технического прогресса в крупном гидротехническом строительстве при межзональном перераспределении стока, *Труды Гидропроекта,* сб. 42, (1974).

Zamakhaev, V. S., Mizinov, P. I. and Shkundin, B. M. Methods for engineering improvement of large-scale hydraulic construction in inter-zonal flow redistribution, *Tr. Gidroproekta,* issue 42, (1974).

Смолко, С. Я. и Ялыгин, В. М. Об исследовании высокоскоростных судов на трассе главного канала переброски, *Труды Ленинградского Политехнического института,* № **351,** (1976).

Smolko, S. Ya. and Yalygin, V. M. Studies of high-speed vessels on the route of the main diversion canal, *Tr. Leningr. Politekh. Inst.*, No. **351,** (1976).

Стольберг, Ф. В. Пути снижения стоимости инженерных комплексов для межбассейновой переброски стока, Сб. *Проблемы охраны и использования вод,* вып. 3, Харьков (1973).

Stolberg, F. V. Methods for reducing the costs of engineering complexes for inter-basin streamflow transfer, *Probl. Okhr. Ilspolzovaniya Vod,* issue 3, Kharkov (1973).

MODELLING AND WATER MANAGEMENT

Bayley, Fred H. III, *The role of the Mississippi River Commission in the Mississippi River Water Export Study,* Symposium on Aspects of the Diversion of Mississippi River Water to Texas and New Mexico, pp. 77–94 (1969).

Boswell, Howard B. *Appendix I: The Texas Water Plan,* Symposium on Aspects of the Diversion of Mississippi River Water to Texas and New Mexico, pp. 136–154 (1969).

Burleigh, Harry P. *The Bureau of Reclamation and the Mississippi River Export Plan,* Symposium on Aspects of the Diversion of Mississippi River Water to Texas and New Mexico, pp. 95–106 (1969).

Fisher, Anthony C. *Some theoretical and measurement issues in economic-assessment of inter-basin water transfers,* IIASA Task Force Meeting on Interregional Water Transfers, Laxenburg, (11–14 October 1977).

Harwuna, M. Okado N. *System analysis for the planning of facilities in inter-basin water distribution problems,* Hemairs Faculty of Engineering, Kyoto Univ., Japan, No. 3, (1974).

Leonard, Robert L. *Integrated management of ground and surface water in relation to water importation,* Giannini Foundation of Agricultural Economics Res. Rep. No. 279, Univ. of California, Berkeley, (1964).

Lovell, Troy Lynn, *A comparison of system designs and operations for the transmission of large volumes of water to West Texas,* Thesis for the M.S. in C.E. Degree, Texas Tech., Lubbock, 68 pp. (1969).

McDermott, Alex. D. *Western states water planning,* Symposium on Aspects of the Diversion of Mississippi River Water to Texas and New Mexico, pp. 59–76 (1969).

Meier, W. L., Weiss, A. O. and Puentes, C. D. *Optimum water management under the Texas Water Plan,* Proc. 14th Congr. Int. Ass. for Hydraulic Res., 5, pp. 351–354 (1971).

Miller, David R. and Miller, James P. Optimizing conveyance systems for water transmission, (1) Am. Soc. Civ. Engrs National Convention, Meeting Reprint 603, San Diego, CA, 28 pp; (2) *Civ. Engng,* **38,** 38–41 (July 1968).

Orlob, G. T. *Planning the Texas Water System,* Fifth Ann. Water Resources Res. Conf., Washington DC, 12 pp., Proc., (3–4 February 1970).

Reynolds, S. E., *Water development and planning for New Mexico,* Symposium on Aspects of the Diversion of Mississippi River Water to Texas and New Mexico, pp. 38–58 (1969).

van der Riet, P. *Simulation of inter-basin water transfer systems with special reference to the Tugela–Vaal Scheme,* Univ. of Witwatersrand Hydrological Research Unit Rep. 8/75, 100 pp. (1975).

Skugerboe, Gaylord V. and Huntzinger, Thomas L. Effects of inter-basin transfers upon water management alternatives in Central Utah, *Water Resour. Bull.,* **7,** 1027–1037 (1971).

Symposium on Aspects of the Diversion of Mississippi River Water to Texas and New Mexico; Panel Discussion, pp. 107–135 (1969).

Tinney, E. Roy, *Planning for massive water resource development,* Symposium on The Continental Use of Arctic-Flowing Rivers, Washington State Univ., pp. 165–176 (1968).

Whetstone, George A. Utilization and control of rivers in the Southwest, *Rivers* '76, Am. Soc. Civ. Engrs, pp. 1149–1158 (1976).

Абрамов, А. В., Озиранский, С. Л. и Раппопорт, В. В. Оптимизация комплексного использования водных ресурсов межбассейновых перебросок стока, Сб. *Комплексное использование водных ресурсов, Тезисы докладов Всесоюзного научно-технического совещания,* Минск, (1975).

Abramov, A. V., Oziranskiy, S. L. and Rappoport, V. V. The optimization of the integrated utilization of the water resources of the flow redistributed between basins, *Kompleksnoye Ispol zovaniye Vodnykh Resursov, Tezisy Dokladoy Vsesoyuznogo Nauchnotechnicheskogo Soveschaniya,* Minsk, (1975).

Агарков, С. Г., Дружинин, И. П., Коноваленко, З. П., Кузнецов, А. Н., Наумов, Т. С., Ушакова, В. В., Герарди, И. А., Дорфман, Н. Л., Коган, Р. Н., Кокорев, Е. П. и Рыскулов, Д. М. Оптимизация размещения водопотребляющих производств, (На примере сельского хозяйства страны), *Водные ресурсы,* № 3, (1977).

Agarkov, S. G., Druzhinin, I. P., Konovalenko, Z. P., Kuznetsov, A. N., Naumova, T. S., Ushakova, V. V., Gerardi, I. A., Dorfman, N. L., Kogan, R. N., Kokorev, E. P. and Ryskulov, D. M. The optimization of the distribution of water-consuming enterprises in the USSR agriculture, *Vodn. Resur.* No. 3, (1977).

Волков, И. А. Некоторые вопросы преобразования водного хозяйства Сибири и решениепроблемы переброски, Сб. *Природные условия Западной Сибири и переброска стока рек в Среднюю Азию,* Новосибирск, (1975).

Volkov, I. A. Some questions of the transformation of Siberia's water resources and the solution of the diversion problem, *Prirodnye Usloviya Zapadnoy Sibiri i Perebroska Stoka rek v Srednyuyu Aziyu,* Novosibirsk, (1975).

Воропаев, Г. В. Проблема перераспределения водных ресурсов страны и её моделирование, *Гидротехника и мелиорация,* № 9, (1976).

Voropaev, G. V. Reallocation of national water resources and its modelling, *Gidrotekh. Melior.* No. 9, (1976).

Воропаев, Г. В. Единая водохозяйственная система страны, *Водные ресурсы,* № 6, (1976).

Voropaev, G. V. Joint water management system of the country, *Vodn. Resur.* No. 6, (1976).

Воропаев, Г. В. и Киселёв, В. Г. К вопросу об оценке эффективности проектных схем перераспределения водных ресурсов, *Методы системного анализа в проблемах рационального использования водных ресурсов,* т. II, Москва (1976).

Voropaev, G. V. and Kiselev, V. G. Evaluating the effectiveness of draft schemes for water resources redistribution, *Metody Sistemnogo Analiza v Problemakh Ratsionalnogo Ispolzovaniya Vodnykh Resursov,* Vol. II, Moskva (1976).

Дунин-Барковский, Л. В. и Моисеев, Н. Н. Система моделей перераспределения речного стока СССР, *Водные ресурсы,* № 3, (1976).

Dunin-Barkovskiy, L. V. and Moiseev, N. N. A system of models for river run-off redistribution in the USSR, *Vodn. Resur.* No. 3, (1976).

Замахаев, В. С. О разработке научных основ к проектным проработкам по комплексному использованию и охране водных ресурсов СССР на период до 2000 года, *Труды Гидропроекта,* сб. 26, (1972).

Zamakhaev, V. S. The development of scientific principles for draft schemes of water resources integrated utilization and protection in the USSR for the period up to 2000, *Tr. Gidroproekta,* issue 26, (1972).

Маркиш, М. С. Об оптимальном управлении уровнем бессточного водоёма (на примере Каспийского моря), *Водные ресурсы,* № 5, (1977).

Markish, M. S. On the optimal control of the water level of a closed water body, exemplified by the Caspian Sea, *Vodn. Resur.,* No. 5, (1977).

Окороков, В. Р., Фёдоров, М. П., Шапот, Д. В. и Щавелёв, Д. С. Исследование эффективности регионального перераспределения речного стока на основе многокритериального анализа, *Труды Ленинградского Политехнического института,* № **351**, (1976).

Okorokov, V. R., Fedorov, M. P., Shapot, D. V. and Shchavelev, D. S. Studying the effectiveness of regional river flow redistribution on the basis of a multi-criterion analysis, *Tr. Leningr. Politekh. Inst.* No. **351,** (Leningrad), 1976.

Шаломаев, М. И. Проблемы водообеспечения республик Средней Азии и Казахстана, *Гидротехника и мелиорация,* № 9, (1975).

Shalomaev, M. I. The problems of water supply in central Asia and Kazakhstan, *Gidrotekh. Melior.,* No. 9, (1975).

JURIDICIAL AND POLITICAL ISSUES

Anon., *Operating principles: Fryingpan–Arkansas Project,* 87th Congr., 1st Session, House Doc. 130, 7 pp. (1961).

Bessey, Roy F. *Political implications,* Symposium on Northwest–Southwest Water Diversion Issues, Oregon State Univ., pp. 59–77 (1967).

Beveridge, James A. *The export of surplus water from Canada to the United States,* Cornell Univ., Water Resources Center, Pbln No. 11, pp. 16–29 (1965).

Bourne, Charles B. *International law and the diversion of the Columbia River in Canada,* Univ. of British Columbia Lecture Series No. 27, pp. 17–25 (1956).

Clark, Chapin D. *Issues and legal aspects of diversion,* Symposium on Northwest–Southwest Water Diversion Issues, Oregon State Univ., pp. 31–46 (1967).

Dersch, Eckhart, *Water resources development—the river basin and the multi-basin region,* Cornell Univ., Water Resources Center, Pbln No. 11, pp. 1–15 (1965).

Ellis, Willis H. Water transfer problems: Law, in Kneese, Allen V. and Smith, Stephen C. (eds) *Water Research,* Johns Hopkins Press, Baltimore, for Resources for the Future Inc., (1966).

Engelbert, Ernest A. Policy issues of the Pacific Southwest water plan, *West. Resour. Pap.,* **6,** 157–204 (1964).

Fox, Irving K. *Some political aspects of large-scale inter-basin water transfers* (*summary*), AAAS Symposium on Arid Lands, Dallas, Texas, 6 pp. processed, (30 December 1968).

Frederiksen, Harald D. Design of California Aqueduct, *Proc. Am. Soc. civ. Engrs,* **95** (IR-2), 307–328 (1969).

Hartman, L. S. and Seastone, Don, *Water Transfers: Economic Efficiency and Alternative Institutions,* Resources for the Future, Baltimore, (1970) 127 pp.

Johnson, Corwin W. and Knippa, Larry D. Transbasin diversion of water, *Texas Law Rev.,* **43,** 1035–1061 (1965).

Johnson, Ralph W. *Major inter-basin transfers—legal aspects,* Legal Study No. 7, National Water Commission, 206 pp. (1971).

Krieger, James H. *Importance of recognition of paramount rights in areas of origin,* Proc. Western Interstate Water Conf., pp. 110–116 (1964).

Ladner, Leon J. *Diversion of Columbia River Waters,* Univ. of British Columbia Lectuɪe Series No. 27, pp. 1–16 (1956).

Laycock, Arleigh H. Canadian water for Texas? *Water Resour. Bull.,* **6,** 542–549 (1969).

Laycock, Arleigh H. Inter-basin transfer—the international dimension, *Water Resour. Bull.,* **7,** 1017–1026 (1971).

Mann, Dean E. *Inter-basin water transfers: A political and institutional analysis,* Natl. Water Comm. Publ. NWC-SBS-72-037, 157 pp. (1972).

O'Leary, Dillon, Canada guards its water against our big thirst, *Reporter*, **34**, 36–38 (27 January 1966), Disc: **34**, p. 13 (24 February 1966).

Piper, Don C. International law as environment for municipal litigation: The Chicago diversion cases, *Am. J. Int. Law*, **62**, 451–454 (1968).

Quinn, Frank J. *Area-of-origin protectionism in western waters*, Doctoral Dissertation, Univ. of Washington, 278 pp. +plates, (1970).

Quinn, Frank J. *Area-of-origin protectionism in western waters*, Social Science Series No. 6, Inland Waters Directorate, Water Planning and Management Branch, Ottawa, Canada, (1973).

Seastone, D. A. and Hartman, L. M. Alternative institutions for water transfers: The experience in Colorado and New Mexico, *Land Econ.*, **39**, 31–42 (1963).

Simsarian, James The diversion of waters affecting the United States and Canada, *Am. J. Int. Law.*, **32**, 488–518 (1938).

Simsarian, James, The diversion of interstate waters in the United States, *Am. polit. Sci. Rev.*, **32**, 907–921 (1938).

Simsarian, James, The diversion of waters affecting the United States and Mexico, *Texas Law Rev.*, **17**, 27–61 (1938).

Snel, J. Problemes d'aujourd'hui et de demain: la gestion de l'eau dans le domaine international (Problems of today and tomorrow: Water management in the international domain), *Techq. Eau Assain.*, **23**, 15–24 (Mars 1969).

Taylor, E. F. Arizona v. California—Landmark on the Colorado River, *Groundwater*, **5** (2), 5–12 (1967).

Towner, P. A. Protection for areas of origin and areas of export in water projects: The California Experience, *Water for Peace*, **5**, 637–648 (1967).

Tyler, Roger, *Water law in terms of planning a future for West Texas*, Proc. 6th West Texas Conf., pp. 89–122 (1968).

Weinberg, Edward, *Intrastate, interstate and international legal and administrative problems of large-scale water transfer*, AAAS Symposium on Arid Lands, Dallas, Texas, processed pp. 352–358 (31 December 1968).

Whetstone, George A. *The changing attitude in inter-basin transfer of water*, Proc. 7th West Texas Conf,. pp. 40–45 (1969).

Whetstone, George A. *A Critique of Ralph W. Johnson's "Major Inter-basin Transfers—Legal Aspects"*, Water Res. Center, Texas Tech., Pbln. WRC 72-1, 25 pp. (1972).

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