with the means to defend itself from a surprise attack, even without being in possession of the Golan Heights.

Barak has indicated that he would be willing to withdraw from the Golan, if he felt that Israeli defense needs could be met in other ways, largely with the aid of sophisticated technology provided by the United States. And yet, from the Israeli point of view, the decision on where the Israeli-Syrian border would lie, is very much dependent on the defense arrangements which would be available to them.

Shara, however, objected to setting a priority on the security issues over the issue of borders. Syria wants the border to lie at the line that existed on June 4, 1967, giving Syria access to Lake Tiberias and control over some key water sources, something that Barak has said would be entirely unacceptable to the Israelis. Although water is one of the specific issues to be discussed in one of the four committees, its significance intertwines all the areas of discussion.

These "procedural" difficulties required President Clinton to spend most of the first day in separate discussions with Shara and Barak. The meeting among the three leaders that had been planned for the evening of the first day (the first occasion in this conference when Barak and Shara would actually talk to each other), had to be postponed until day two.

Although the three parties did meet the next day, when President Clinton again returned to Shepherdstown, the talks began to lag shortly thereafter. Four committees, with representatives from the Israel, Syria, and the United States, dealing with the main problem areas involved in a Syrian-Israeli peace accord—security, water, borders, and normalization of relations—were formed. Indicating some of the problems that still exist, the "normalization" category was renamed by the Syrians "normal peaceful relations," since "normalization" of relations with Israel is still considered a very sensitive issue in Syria. The only committees that met, however, were the committees on security and on "normal peaceful relations." At the same time, the U.S. delegates to the other committees did meet with their counterparts on both sides, to convince the Syrian delegation that the issue of borders was not being ignored.

Success in the Syrian-Israel track would have profound implications for the entire Mideast peace process. If Syria makes peace with Israel, this would open the way for a viable peace with Lebanon, given the overwhelming preponderance of Syria in Lebanon—as well as its influence over the Hezbollah terrorist group operating in southern Lebanon. Initial statements by the Iranians also indicate that they would not be averse to a Syrian-Israel agreement. If the Iranians allow the Hezbollah to be transformed into a "political party," as some statements coming from there have indicated, it might also remove the last roadblock to improved U.S.-Iranian bilateral relations. As State Department spokesman Jamie Rubin expressed it in a briefing, "This is a big, big deal."

Mideast peace requires water, power resources

by Marcia Merry Baker

When the peace talks commenced on Jan. 3, 2000 in Shepherdstown, West Virginia between representatives of Israel and Syria, four ongoing commissions were approved on specific topics, one of which is water. This reflects the well-appreciated fact that there can be no concurrence over security, borders, and normalization of relations (the other three goals) without agreement on water. Moreover, what is involved is not simply a matter of "sharing" or observing "fair" water rights. In this ancient, long-inhabited region, there is simply not enough water to "share."

Thus, the new peace dialogue implies a commitment to work out how new water and power resources can be provided in the common interest of all. A breakthrough in this critical part of the world would be of international strategic importance. It puts the question of infrastructure-building back on the agenda for all world leaders and concerned citizens, at a time when such nation-serving commitments are required, instead of acquiescing to the financial breakdown and chaos otherwise occurring.

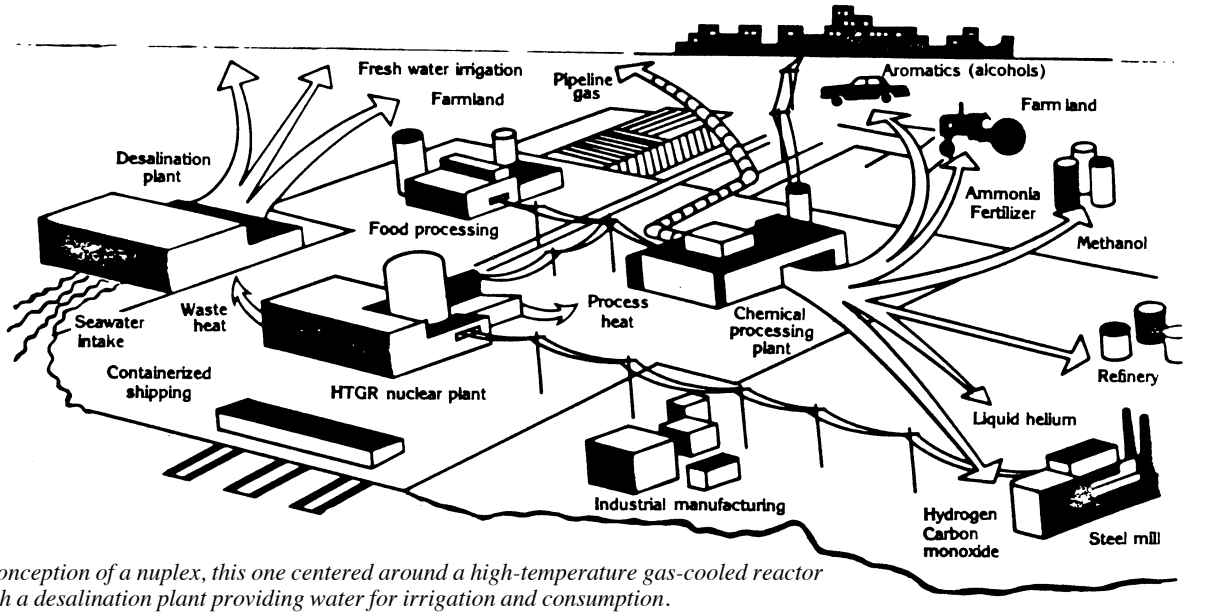
In the historic 1993 Oslo Peace accords between Israel and the Palestine Liberation Organization, water was also a paramount issue, but the agreements were not carried through, under the fierce anti-development climate of the declining International Monetary Fund era. Annex III of the 1993 accords was an economics protocol ("Protocol on Israeli-Palestinian Cooperation in Economic and Development Programs") which listed nine points, the first of which concerned provision for water. The agreement was for "cooperation" in managing water resources, and "equitable utilization" of joint water supplies, as well as electricity, clearly implying the need to *make new supplies*. They were not carried through.

Technologies and plans exist

For decades, engineers have had plans for providing new water supplies in the region of the Jordan River basin, and throughout the Middle East. Technologies have been available all along, and today there are new R&D improvements.

The year 2000 Syrian-Israeli talks call to mind for many, the Mideast water supply development perspective of mid-century, named the "Johnston Plan," in honor of a diplomat of the Eisenhower administration who promoted a framework for undertaking large-scale waterworks. During the 1950s Atoms for Peace period, there were missions and studies on

FIGURE 1



An artist's conception of a nuplex, this one centered around a high-temperature gas-cooled reactor (HTGR), with a desalination plant providing water for irrigation and consumption.

the specifics of providing new water resources to the Middle East region. In 1958, President Dwight Eisenhower addressed the United Nations on the subject of water and power development proposals for the arid Middle East: "The ancient problem of water is on the threshold of solution. Energy, determination, and science will carry it over that threshold," he told the UN General Assembly, on Aug. 13, 1958. Unfortunately, this did not come to pass.

In the 1960s, feasibility studies for "nuplexes"—complexes of agro-industrial activity centered on nuclear power sources, including water desalting facilities—were carried out by the U.S. Atomic Energy Agency and Oak Ridge National Laboratory in Tennessee. Site-specific studies were done for various places including the Kutch, in Gujarat, India, a semi-desert area where conditions are similar to the Mideast. But, the nuplex campaign was shelved. **Figure 1** illustrates the idea of the nuplex, where power (both electricity and process heat) and freshwater can be supplied for many uses.

In the 1970s, *EIR* began publishing updates on the technologies that could be applied to "make the desert bloom," not only in the Mideast, but throughout North Africa and elsewhere. Lyndon LaRouche promoted the high-technology development perspective for arid lands, as the "Oasis Plan," in which nuclear power and advanced desalination, coupled with water engineering, could create new "oases" and man-made "river" corridors of economic growth.

In September 1993, at the time of the historic Oslo Accords, LaRouche urged an international mobilization to launch needed projects, entitled "Break Ground Now," aimed at heading off sabotage by anti-development political and financial circles. Earlier, before the Bush-Thatcher instigation of the Persian Gulf war, LaRouche also publicized the infrastructure-building path to peace involved in the "Oasis Plan" approach.

On Dec. 3, 1999, *EIR* Editor Muriel Mirak-Weissbach presented the need for a crash program of nuclear desalination development, at a conference of the Middle Eastern Businessmen's Association, of the Danish Confederation of Industry. The idea was very well received by diplomats from throughout the Mideast and North African region (see "Mideast Talks Must Solve Water Resource Shortage," *EIR*, Dec. 17, 1999).

Economic geography

Figure 2 was first published by *EIR* at the time of the 1993 Mideast peace accords, and is based on LaRouche's "Oasis Plan" perspective. It schematically shows selected features in and around the ancient Jordan Rift Valley and basin. The map also shows political borders and key cities, and infrastructure-development symbols, indicating the kind of projects that can be built. (The project locations are not exact, but indicative.) First, consider the dimensions of the water shortages.

The Jordan basin water resources might adequately supply a population living in modern standards of 5 million people, but the population in the immediate area exceeds 14 million. For many years there has been, in the greater Mideast region, too little water, in per-capita and per-hectare terms, to support basic economic activity.

Figure 2 shows parts of the network of surface run-off, and underground springs and flows connected with the Jordan system. The volume of water involved is very small, and the *outflow exceeds the resource base*. One way to appreciate this

FIGURE 2

Selected infrastructure projects for the 'New Mideast'

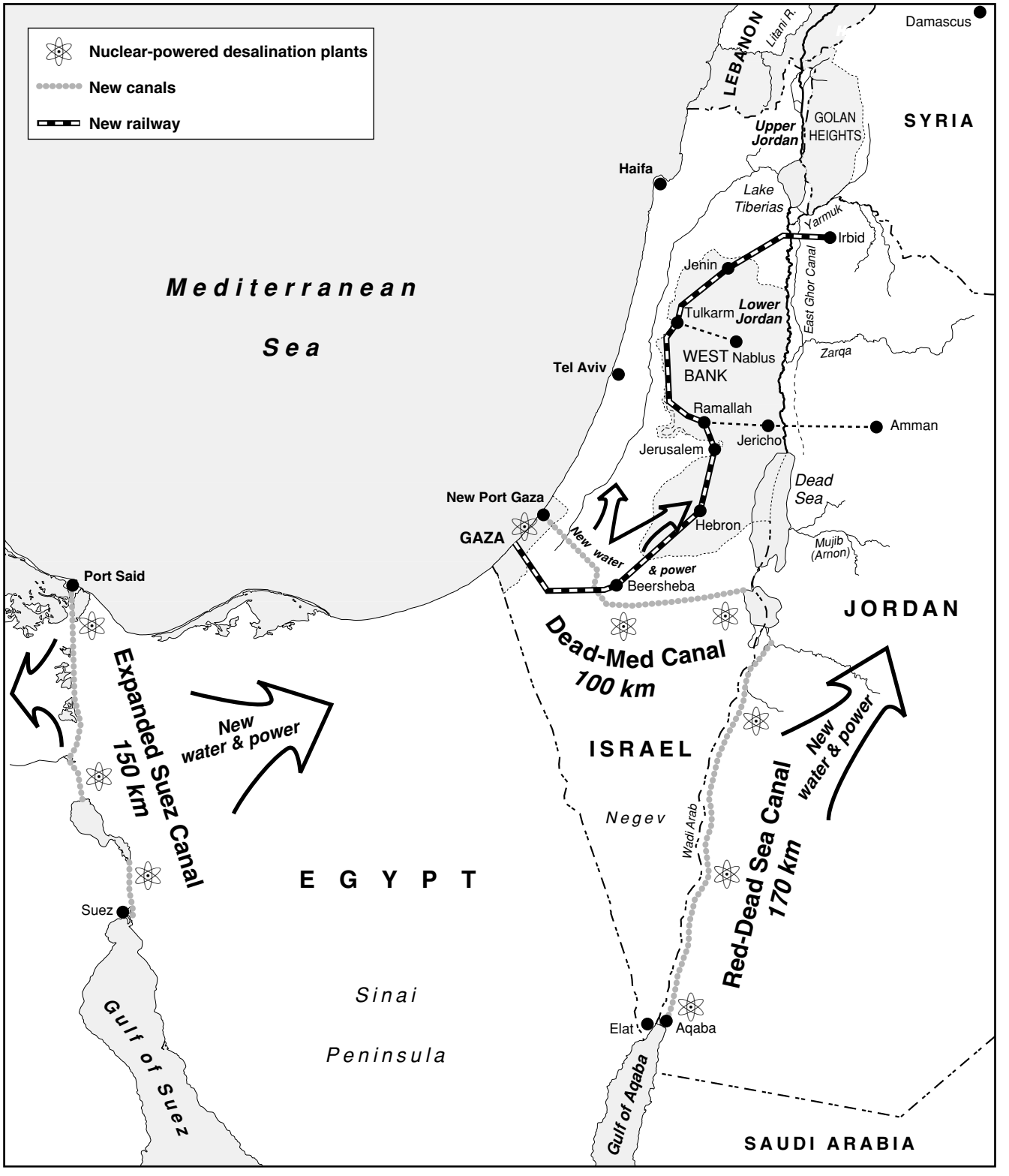
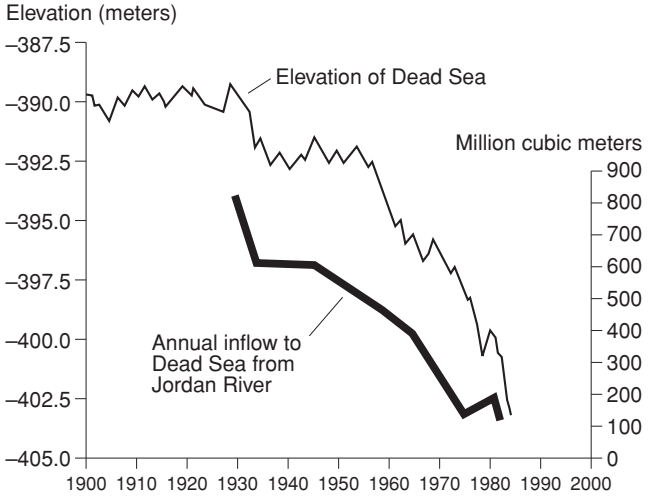
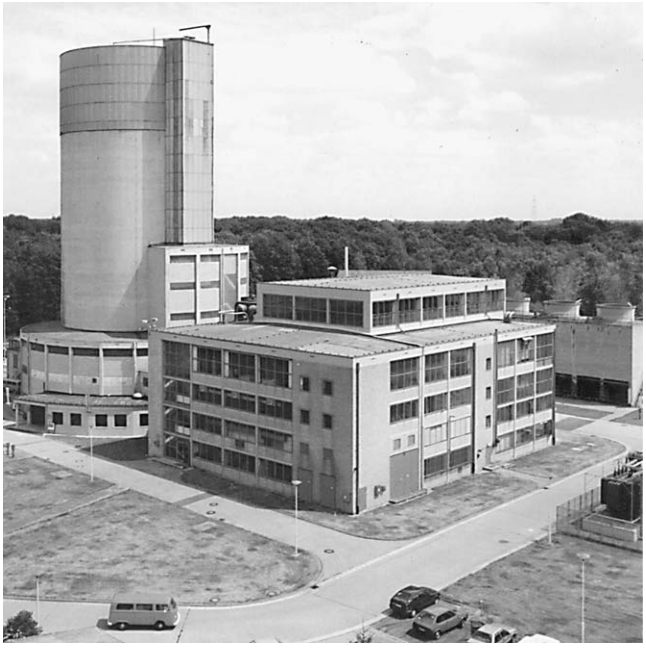


FIGURE 3

The Dead Sea's level has been dropping steadily since 1930



Source: Uri S. Würzburger.



The AVR experimental high-temperature nuclear reactor (HTR) at Jülich, Germany. A full-sized HTR is now under construction in South Africa, promising both inexpensive electricity, and process heat for many applications.

problem, is to see how the level of the Dead Sea is going down (**Figure 3**). In 1950, the Dead Sea was about 390 meters below sea level; today, it is more than 408 meters below. Due to the various diversions of freshwater, mainly from Lake Tiberias and the Jordan River, the amount of water draining into the Dead Sea from the north via the Jordan decreased. The sharpest decrease came after the 1970 construction of the National Water Carrier, and the Ghor Canal.

West of the Rift Valley, the annual natural water supply is about 1,700 million cubic meters (mcm), while demand is 2,000 mcm; east of the Rift, the supply is about 600 mcm, with a demand of 1,100 mcm. The deficit is thus in the range of 800 million cubic meters.

Israel consumes most of the surface and underground water in the Jordan River basin. Water supplies are at crisis lows in the nation of Jordan. This is all the more pressing, because Jordan took in more than 300,000 refugees from the 1991 Gulf War.

Syria depends greatly on the Euphrates (which rises in Turkey), on the Orontes, and also on the very small amount of water available from the eastern banks of the Jordan basin. When Israel took control of the Golan Heights in 1967, it took control over critical water resources in this part of the Jordan system.

Also, within Israel, the inequity of water availability is great between Israeli and Palestinian. The Palestinians are experiencing severe shortages. Compared to the 1,000 cubic meters per person of water which Israeli settlers in the occupied territories enjoy each year, the Arab population of 1 million had 137 cubic meters per person, back in the early 1990s. Today, it is worse. Gaza is dependent on ground water, which is increasingly saline. Diseases linked to unsafe water are twice as frequent there as in the other territories that have been occupied since 1967.

Make 'natural resources'

Where is the water to come from to relieve this crisis? The answer is, *it can be man-made*.

Figure 2 shows selected water-making projects, along with other needed infrastructure priorities for Mideast development, such as rail and power lines.

The symbol for atomic power is shown at different sites on the map, to indicate that nuclear-powered desalination plants are the only realistic high-energy mode for the future. The chief cost of desalination is the energy source. Light-water reactors are off-the-shelf technology; and proposed modular, high-temperature gas-cooled reactors (MHTGR) are the next-generation power source.

Locations along the seacoasts are the priority sites for nuclear-powered desalting plants, including northward at points on the Mediterranean in Lebanon and Syria. From coastal sites, sweet water can be piped the relatively short distances throughout the whole region for targetted use.

But also, nuclear-powered desalination plants at points on long-proposed canals are an option, creating the resource base for new development corridors. Figure 2 shows a hypo-

thetical route for a "Med-Dead" Canal (shown beginning at New Port Gaza), the "Red-Dead" Canal, and other routes.

Such canal projects raise concerns over channeling seawater through established agriculture regions, because of the risk of salt water intrusion from mishap or mis-calculation. But there are also benefits of increasing flow into the Jordan/Dead Sea basin to increase the hydrostatic pressure. These are the challenges of hydrologic engineering, which can be worked out.

One novel geo-engineering proposal calls for running Mediterranean seawater eastward through a conduit starting south of Haifa, to a point south of Lake Tiberias. At that point (north of the town of Beisan), the water has a 320-meter drop into the Jordan Rift, where reverse osmosis-type (RO) desalination plants which can process the seawater can be located. By utilizing the waterfall energy of the elevation difference, the RO desalting process will require no more than one-third of the mechanical energy needed by conventional RO plants. The modern RO membranes are capable of separating the seawater into a product of high-quality drinking water, and a remaining flow of brine—which, though salty, is less salty than the Dead Sea, into which the augmented flow can run. An estimated 800 million cubic meters of desalinated water per year could be produced, a potential capacity that almost equals the flow of the original Jordan River.

High-temp, gas-cooled nuclear reactors

However, the optimum technology for both generation of power and desalting of water, and for improved safety and management at varied locations, is the proposed high-temperature, gas-cooled reactor design. A module of this type, designed to be sited underground, can provide 350 megawatts of power, and can easily be mated into a unit of four modules, producing electricity, and power for desalting, especially through the multi-effect distillation process.

Just 20 such nuclear-desalination sites could provide a volume of water to equal the entire "natural" annual flow of the Jordan system. Thus, a second Jordan River could be created! Such designs have been worked out by General Atomics of California, and by the European companies Siemens and ASEA Brown Boveri.

The photograph shows an experimental reactor at Jülich, Germany, which successfully demonstrated the feasibility of a high-temperature, gas-cooled reactor, with its potential for desalting seawater and many other applications.

Even while a gear-up is under way for such advanced design projects, off-the-shelf conventional thermal-powered desalination plants are the only realistic interim solution.

In the context of the ongoing Syrian-Israeli talks on water rights, it is important to take note of the vast experience that the Saudis have gathered in the field of desalination. Of course, the Arabian peninsula is rich in oil and natural gas deposits to power the desalting facilities, but what the Saudis have achieved in high-technology methods, makes clear that water can be produced, relatively cheaply, and in significant quantities. What is required, are the funds and the technology.

Saudi Arabia is the world's largest producer of desalinated water, with 572 million gallons per day, from 27 stations. This covers 70% of the required potable water. Desalination was introduced in 1928, when King Abdul Aziz ordered the first station built in Jeddah. Later, Al-Jubail became the biggest desalinated water center in the world. Reports indicate that production will increase to 800 mgd, and more than 5,087 megawatts of electricity will be produced. There will be 4,000 kilometers of pipelines, and 166 reservoirs, with a total capacity of 9.3 million cubic meters of desalinated water.

On Nov. 15, 1999, Dr. Fahad Balghunem, governor of the Saline Water Conversion Corp., reported on progress in building three more desalination plants, in al-Khobar, Jubail, and al-Shoaiba, and five delivery stations. On completion of this project, he said, there will be 4,155 km of pipelines for water, and 29 pumping stations. He said that the corporation is studying the possibility of setting up 20 more water desalination plants, with a daily production capacity of 2.6 mcm, and 12 water delivery system projects with a total length of 2,640 km.