In this study, since ignored, he showed that the tops of the mountains, such as Tibesti, Ennedi, or Aïr, were the starting point for daily storms and precipitation. From his observations, accumulated in his work *Refoulement du Sahara* (*Rolling Back the Sahara*) published in 1930, he proposed a series of solutions to increase the rainfall over entire regions, which center around a climatic principle one could dub the "Dessoliers paradox," which goes something like this: How can one force precipitation from a humid air mass? Either one can raise the relative humidity, or cool it down such that it reaches the temperature limit of saturation. But if the air mass is not humid enough, paradoxically, it must be heated. In effect, rain is a phase change; hence, the effect of work. By superheating a sufficiently humid air mass, thermal energy is transferred in the form of "latent heat." This latent thermal energy produces the work of elevating this air mass, and hence its energy potential. If this energy potential is sufficiently great, the humid air mass will rise to the colder levels of the troposphere. By convection, but also by expansion (the principle of refrigeration), the air will cool off enough to attain the temperature limit of saturation, to precipitate in the form of rain drops. This precipitation also causes the release into the atmosphere of part of the accumulated latent heat in the form of water vapor. Dessoliers observed that the more humid and warm the air, the more it will "potentially" hold, and the higher and greater the cloud formations.

This is the principle behind climatic thermodynamics and therefore the water cycle.

Dessoliers conceived of the construction of coordination centers of superheated air (large solar reflector surfaces) fed by water vapor (by siting them near forests, lakes, and farmlands). The superheated air would draw in air that would be channeled toward the center by a conical metal structure, in order to create a localized cyclonic low pressure area.

Today, we could suggest using towers similar in form to those used in nuclear plants. Their hyperbolic form will be a necessary element to reach the required altitude with a minimum of starting energy (latent heat).

Adapted to the problem of Lake Chad, this principle will allow us to recover, bit by bit, by daily rains, part of the 50 billion m^3 of water (some 2 m of depth) that are lost every year to the Saharan winds and seepage.

In order to develop a new water cycle, we must take the following measures:

- reforesting the mountain heights in order to humidify the natural air drafts in the plains;
- irrigation works;
- greenhouse agronomy, using a system of filtering all solar wavelengths except those absorbed through photosynthesis, permitting a temperature drop favorable to all growth.

Water projects on the drawing boards

by Marcia Merry

Africa is part of the world's greatest dry land region, due in part to unique geographical features. The vast expanse from east of the Atlas Mountains in North Africa, extending through Southwestern Asia to the Indian Desert, is an area without close exposure to ocean-related rainstorm patterns. However, rivers and lakes can be created as two important proposals for water development were described in EIR, *Sept. 28, 1990:*

The Jonglei Canal

In southeastern Sudan, where the upper White Nile River rises, before joining the Blue Nile and flowing on as the Nile River into Egypt, there are extensive marshy areas known as the Sudd swamp (see map, page 73). Construction of a channel from Jonglei, at the swamp, downwater to Malakal, and construction of a canal system, would regulate the swamps of southern Sudan, where large quantities of water are now lost by evaporation. Much of this water would be conserved, and the flow of the White Nile increased. Hundreds of thousands of acres of prime farmland would be created in the process in Sudan.

The project was started, then halted because of funding problems, and the obstructionism of the ecology movement, which has made preserving swamps and "wetlands" the excuse for stopping water improvement programs.

Groundwater development

In 1984, satellite overflights of the Mideast and North Africa, and use of the "Big Camera" infrared sensing (from Itek Optical Corp.), confirmed the location of significant bodies of underground water, whose existence was previously known only in part. The satellite data give only the location; the depth, quality, and size of the water deposits must be confirmed by on-site hydrological measurements.

Subsequent tests show quantities of underground water in the western Egyptian desert that could provide sweet water for 50 years of agriculture. One proposal is to undertake the construction of strings of oases, forming corridors of agriculture and settlement, and converting the sands of the desert into sod. The siting and archeological features of these water deposits indicate the existence of rivers flowing northward into the Mediterranean Sea from highlands in central Africa.

In the western Sahara there are at present extensive underground flows of water, whose direction and quantities could be programmed for use.