illusion of democracy? Can it, or can it not, be used as a basis for creating new forms of collective organization?

In the Soviet Union, the "agrarian revolution" went against the old *mir* peasant community. In China, the village (albeit modified) was the linchpin of the new communes. Throughout the Third World, especially in countries that base their development on socialist principles, respect for traditional forms of settlement as a starting point for a balanced development has been, and continues to be, a basic element even though there have of course been nuances in the implementation and degrees of acceptance and interpretation. Reactionaries tend to accentuate what is picturesque, what is folklore, and coopt tribalism and native architectural styles in order to highlight "typically local features." A progressive approach, on the other hand, consists of coopting a vast heritage of forms of living (and spatial forms and technologies). Through study, development alternatives are made in keeping with the new society to be constructed. This is not a quick or linear process. The one certain thing is, however, that it cannot be genuinely revolutionary unless it encompasses the real roots of the people.

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Hassan Fathy's Abiquiu: An experimental Islamic educational center in rural New Mexico

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Introduction

More than 30 years after New Gourna — that extraordinary but aborted monument in Upper Egypt to the possibilities of beautiful, culturally-appropriate low cost adobe (mudbrick) housing for the poor, to be built cooperatively by the poor — Hassan Fathy has again designed the central civic core of a rural Muslim community and initiated its construction. But this time the site is in the southwest USA and the universal response has been most favorable as a sampling of articles that have appeared in various technical journals and publications would indicate.[1]

There is a large element of inevitability to this event. Frustrated over several decades in his efforts at community building in Egypt, Iraq, Saudi Arabia and Oman, Hassan Fathy nevertheless acquired a significant following among architects, community planners, adobe builders, art historians and social critics in the West during that same time.[2]

His case for New Gourna, barely circulated in its original English edition published in Cairo (FATHY, 1969), was reissued in the early seventies in the United States (FATHY, 1973) where it also had a strong impact upon many of the young people who had left the universities to live in rural intentional communities (the "communes") and were drawn both by the ambience and the climate in those first years of energy crisis, to the southwest and to adobe architecture as a soft technology.

One of the higher components of this American commune culture of the seventies was an attraction to varieties of Eastern spirituality; for some young Americans that came to mean a commitment to Islam. This further reinforced the attraction to Hassan Fathy's approach — universal in its insistence on the spiritual as well as material appropriateness of architectural design,

but specifically manifest in his own work as the revival of the principles of traditional Arab-Islamic architecture, with all of its own unique demands in the treatment of space (FATHY, 1963, 1969, 1972, mss, n.d.) (BURCKHARDT, 1967, 1970).

The Abiquiu project is sponsored by Dar al Islam Foundation, an American-based, private nonprofit organization with an international board of trustees committed to building an endowed Islamic educational center in New Mexico.

New Mexico is one of the southwestern American states where adobe architecture is the indigenous tradition — American Indian pueblo and Spanish colonial mission — and the beneficiary of a noticeable revival that is in part stimulated by adobe's attractiveness and historic authenticity but also for its superior passive solar energy designed uses (DETHIER, 1983).

New Mexico's capital, Santa Fe, has enacted a building code that requires construction in most of the city to conform to the vernacular adobe style and limits building height to three stories. Model suburban communities have arisen around the cities of Albuquerque, New Mexico; Tuscon and Phoenix, Arizona; and Palm Springs, California that are entirely constructed from adobe.

Abiquiu lies at a latitude of 36 degrees north, which places it in the same zone as Morocco, Algeria, Tunisia, Syria, Iraq, Iran, Afghanistan and Pakistan, and it is characterized by similar terrain — a narrow, lush river valley, sparse mountain range topped by desert plateau — and climatic conditions (DURKEE,1981). A traveller from the Middle East feels very much at home in Abiquiu. And American Muslims — many of whom first encountered Islam wandering across North Africa in the sixties and Syria, Afghanistan and Pakistan in the early seventies — sense the austere rural beauty of the terrain as a spiritual support.

Fathy in Abiquiu, New Mexico

In June 1980, Fathy, accompanied by two of his master masons from Upper Egypt, visited the site and conducted a workshop to train the builders at Abiquiu in the Nubian techniques of building domes and vaults of adobe without using wood forms. The demonstration model was to become the first building at Abiquiu — the *masjid* or mosque.

The workshop drew adobe builders and architects from the region including across the border, from Mexico, as well as local officials from the Housing and Urban Development Department of the US government to Abiquiu — all of whom were interested in the cost cutting possibilities of using adobe domes and vaults to cover roofs of adobe housing that at present require increasingly expensive wood beams (HOMANS, 1980, SHEPARD, 1980, VAUGHAN, 1980).

Construction procedures and Fathy's remarks were taped and subsequently edited into several hour-long video training programs produced by a film maker

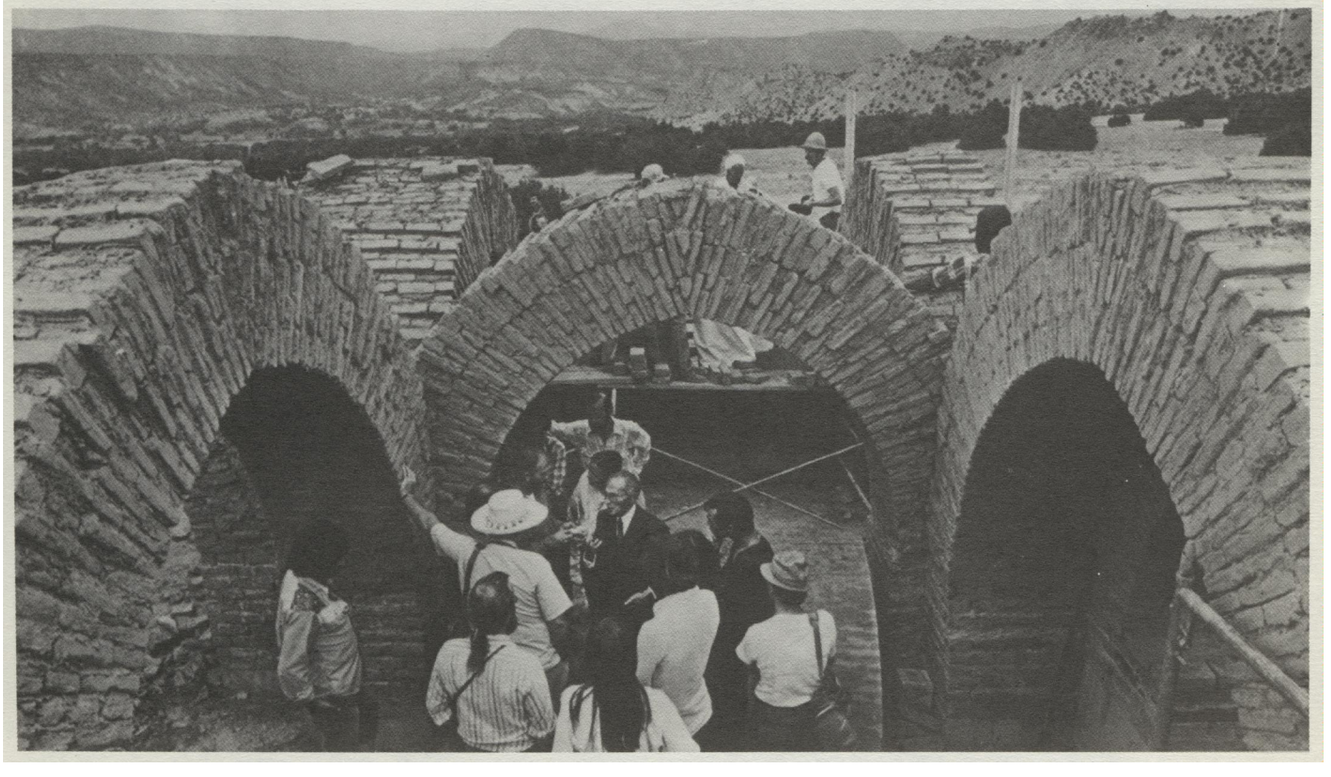

Fig. 1: Hassan Fathy at Abiquiu demonstration workshop, September 1980 (Photo by Jacques Evrard and Christine Bastin in DETHIER, 1983).

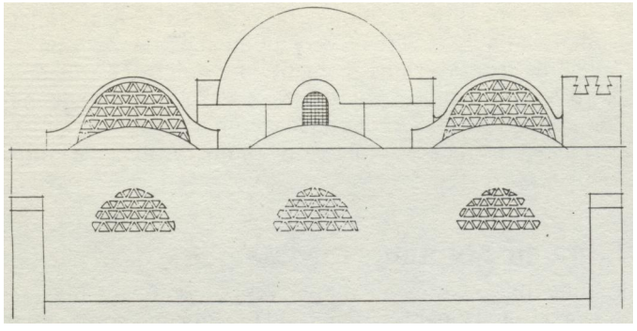

Fig. 2: Hassan Fathy's drawing of the Abiquiu mosque. Two vaults based on catenary arches flank the large Sassanid dome that dominates the structure. Three of the six Byzantine domes are also visible in this view.

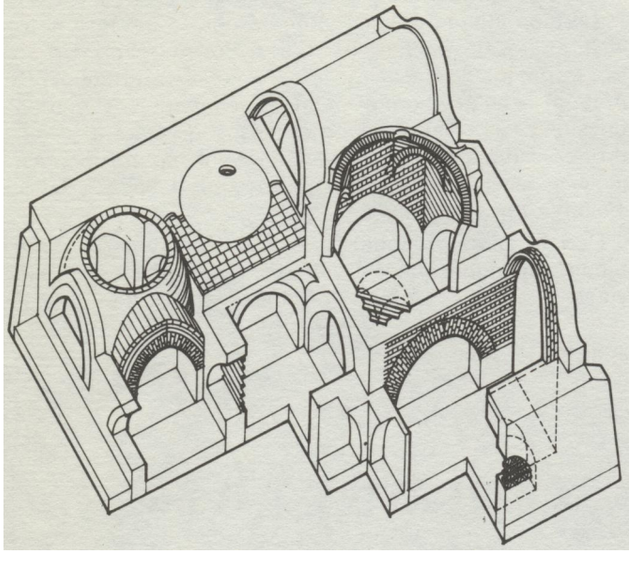

Fig. 3: Axonometric drawing of the mosque in Abiquiu.

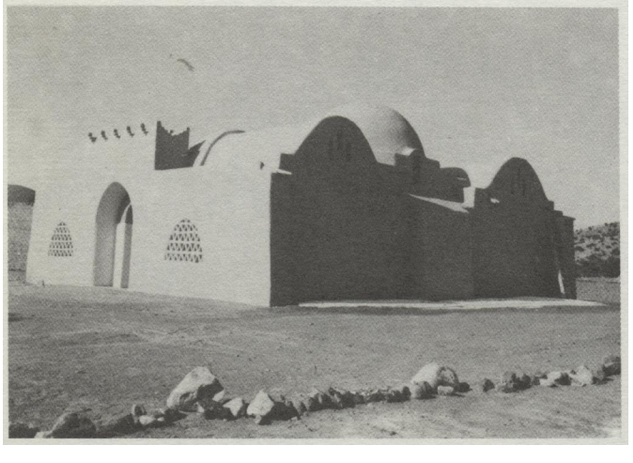

Fig. 4: The mosque in Abiquiu.

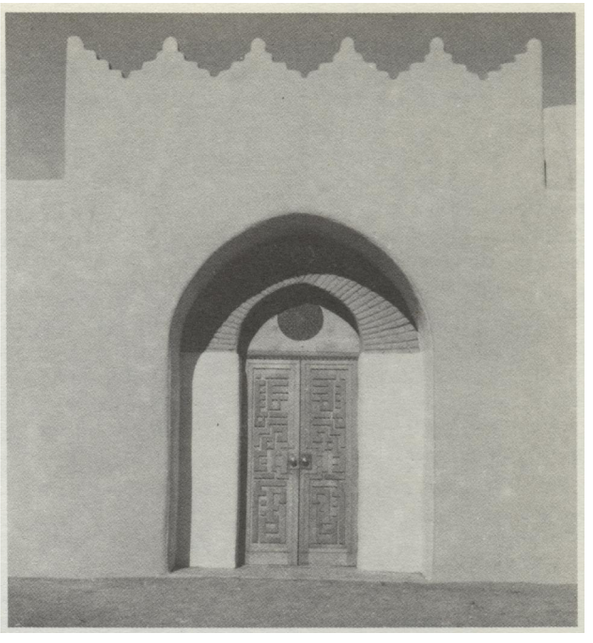

Fig. 5: The entrance to the Abiquiu mosque with a locally crafted *sabras* door. Inset above the lintel is a locally designed and executed illuminated Koranic calligraphy sandblasted onto a round glass panel.

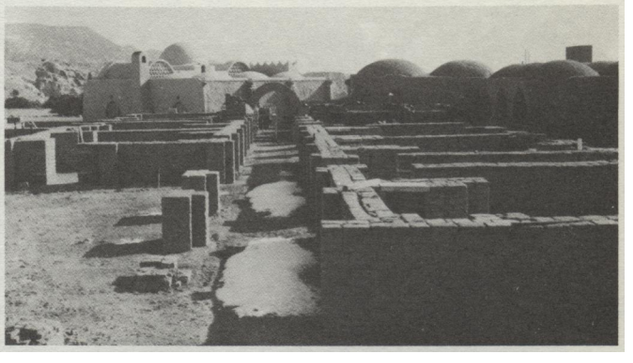

Fig. 6: Lower walls and the first series of domed classrooms for the madressa under construction with the completed mosque in the background.

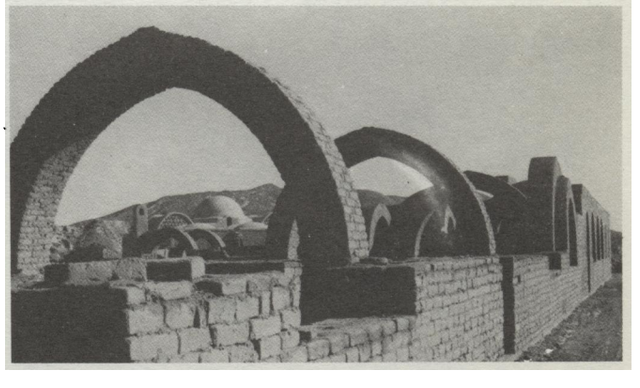

Fig. 7: The lower walls and arches of the madressa.

associated with the University of Arizona (fig. 1) (WHITE, 1981).

A year later Hassan Fathy returned to Abiquiu to inaugurate the mosque and lay the foundation stone for the *madressa,* the elementary school immediately adjacent to the mosque now under construction. The 210 square meter adobe mosque, which is traditionally the first building to be constructed in a Muslim settlement, incorporates Byzantine and Sassanid domes, barrel vaults and large pointed arches in its design. Perched near the edge of the plateau that overlooks the Chama River valley, it so perfectly matches the drama of its site that it has already been hailed as an American adobe classic (figs. 2, 3, 4, 5).

The madressa, which includes a library wing, is connected to the mosque by a long domed corridor. Including its interior courtyards, the madressa encloses a 3,669 square meter area planned as a simple module in which the small domed classrooms and library areas are all arranged around the series of interior courtyards (figs. 6, 7).

All of the architectural detailing has been done by the small corps of resident craftsmen who have been gathered in Abiquiu by the present needs and future prospects of the project and by its social-spiritual appeal — an opportunity for limited numbers of American Muslims to live, to work, to raise and to educate their families in a peaceful, rural environment supportive to religious life.

Fathy also brought with him a provisional master plan for the civic center of an eventual rural settlement on the two square miles of land owned by the Foundation — one-third of which is agricultural.

Cash economy and social void

But Abiquiu is not "New Gourna West." Only 18 families associated with the project — as administrators, teachers, construction workers and independent craftsmen — are as yet settled on or around the estate. Nor is construction proceeding in accord with the mutual aid, cooperative system outlined by Fathy in his writings. This system requires preexisting communal ties and traditional social structure, a neighboring parent village for satellite settlement, tribal or clan relationships and a subsistence economy that provides (as Upper Egypt did before the Aswan High Dam eliminated the dead season of annual flood) the time and the available, willing labor for cooperative work.

The Abiquiu project unfolds in a social void. The American Muslim craftsmen and teachers already drawn to the project at its infancy stage are neither the advance guard of an older neighboring village nor part of a traditional structured tribe that had been roaming around and about New Mexico for generations. They are all highly mobile individuals, members of tightly defined nuclear families and all are participants in the American cash economy.

In the capital-intensive American cash economy, producing and using adobe brick is an expensive proposition. Its cubic foot (in place) cost is $ 3.00 compared to $ 3.50 for cement because it is labor intensive. Each adobe brick must be handled seven times before it is in its final place on a wall, dome or vault. At the New Mexican average rate of pay of $ 5.00 an hour for construction work (which is low by national standards) adobe brick walls are more expensive than poured concrete.

The Abiquiu project's costs are coming in at $75 to $100 per "finished square foot," which seem comparable or even lower than the cost of all other conventional commercial construction, except mobile homes. This, however, is misleading as items such as sophisticated and expensive finishing and furnishings, factored into the conventional American construction costs, are compared with the low cost, simple, traditional Islamic finishing and minimal furnishing.

The use of mechanical help for mixing mortar and a fork lift manned by a single operator to lift bricks to several crews reduces workforce costs but does not alter the time factors for construction (FATHY, 1973).

The northern New Mexican climate is far harsher than that of Upper Egypt — there is rainfall and snow in the winter and as in the case of Afghanistan, northern Syria and the mountains of Morocco, a mud plaster would have to be reapplied annually, which does not represent a particular hardship in traditional cooperative village culture and subsistence economies, but, in the American cash economy, it would mean a significant annual expense. Instead of replastering the mosque, outer surfaces have been cement sprayed with a crushed limestone aggregate in lactic acid base with cellulose fiber for expansion/contraction coefficient.

The domes and vaults act as superb cooling devices in the summer but rapidly lose heat when the temperature abruptly drops during cold winter nights, unimaginable in Upper Egypt. The contrast between nighttime low outdoor temperature and nighttime indoor temperature (maintained by subfloor electrical grid mats and wood burning heaters) also creates condensation at the top of the domes which could eat into the brick courses and through freezing and thawing action, weaken the crystalline composition of the bricks.

To offset these two problems the Abiquiu builders are preparing to spray the roof with a 10.16 centimeter layer of foam which will provide an insulation factor four times greater than the present one, and by creating a buffer on the outside between the extremes in temperature will reduce or eliminate condensation. Condensation is also being controlled by imbedding wicks into the outer walls to draw off moisture from the bottom of the domes.

In search of the appropriate

The Abiquiu builders have tested a recently developed hydraulic adobe brick maker, but its performance was not consistent, so they are looking in another direction. Over the past year they have carried out experimental building at other sites on the estate using pumice — volcanic rock — which is readily and inexpensively available in New Mexico. In place, its cubic foot cost is half that of adobe and cement. Pumice is extremely light and can easily be poured in a 40-to-1 pumice-to-cement binder mixture. Spongy and porous, pumice easily absorbs water and can be worked for a longer season (10 months) than adobe (8 1/2 months) (VEN DER STRAATEN, and DURKEE, 1983).

Pumice is even more promising than adobe for passive solar energy uses. While adobe has twice the radiation value of cement, pumice has three times the radiation value of adobe. But pumice, unlike adobe, has little compressible strength, which limits its use to one-story walls, vaults and, as soon as the Abiquiu builders can determine how, to poured domes.

Wood forms for puddled walls or poured vaults, made of cheap plywood in the US, are not as expensive in terms of labor cost as they were in Upper Egypt. Assembling them for a small once-only operation, however, consumes much of the time that the actual easy pouring saves in comparison to laying adobe brick. At present Durkee and ven der Straaten are considering its use along with adobe in the next construction — the *riwaq* (residence for boarding strudents), which has been designed by Hassan Fathy in replicating modular units and calls for the construction of a row of 70 vaults.

The methodology acquired from Hassan Fathy — the uses of appropriate technology for rural settlement — remains; what has changed is a greatly increased sensitivity as to what is the specific social and economic setting to which (among other elements) technology must be appropriate.

To the degree that the Dar al Islam Foundation can fulfill its mission to build an endowed educational center at Abiquiu, with levels and dimensions of instruction that will range from an Institute of Traditional Islamic Studies offering accredited postgraduate studies; to centers for the revival and practice of traditional Islamic crafts and appropriate technologies; to the elementary school now under construction and its eventual sister high school — then a steady-state rural settlement will evolve as an inescapable and organic outgrowth of Abiquiu as a rural educational center.

Models

If there are models for this process they are not to be found in the tragically unfullfilled vision of village cooperation and renewal of the Egyptian countryside that animated the design of New Gourna. The closest at hand in time and place for Abiquiu are the dozens of small university and college towns to be found in rural America that arose around the 19th century "land grant" college. Each college drew the craftsmen and merchants necessary to sustain the academic community and encouraged local agriculture by providing technical extension courses and, almost incidental to its generally religious educational mission, by providing a local market and local social services.

Still older models are to be found in the origin of many rural settlements in medieval Europe and the Islamic world — villages rising slowly in the shadows of an endowed institution devoted to some higher pursuit other than worldly rural life; the North African *ribat* (such as Monastir in Tunisia) endowed to maintain volunteers who served under a spiritual discipline guarding the coast, or, the European monastic centers of learning and the rural cathedrals that became Cathedral towns (MUMFORD, 1970).

Once we define rural settlement in strict terms that exclude the suburban and exurban dependency relationship to neighboring urban centers and insist upon agriculture and/or livestock as a vital characteristic of the environment, then there is no other viable model for recreating rural community (that is, in contrast to a corporate farm's dormitory housing area) in a highly developed cash economy.

To the extent that the Third World countryside, with the onslaught of the cash economy, has lost not only its traditional crafts but also its traditional social organization that gave it the capacity for voluntary and organic (rather than coercive state bureaucratic or utopian) revival, based on mutual aid, and which Hassan Fathy reasonably sought to revive in Upper Egypt, the Abiquiu project with its tactic of rural settlement based on an endowed spiritual-educational center may be worth serious consideration in the "developing" as well as the "developed" world.

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Notes

1. See references 17, 12, 4, 15 and 5.
2. Fathy also had an extended association with the Athens Center of Ekistics during this period.