NATURAL LIGHT

9. Shaded street, North Africa

Whether lighting a reading alcove in Exeter Library, a classroom in the Open Air School, a bathhouse in Turkey, or shading a street in North Africa, light has been a primary element of the Architects' and builders' palette for millenia.

Natural light is necessary for human health and well being. Common sense would tell us that people work and live better under natural lighting conditions. In a school environment, it has recently been documented that students perform better in natural light. According to a study by a California energy consulting firm, cited in the October 13, 1999 issue of the Roanoke Times, students from rooms exposed to the most daylight performed significantly higher on standardized tests. Natural lighting the built environment can also decrease the amount of energy

10. Glass block skylight
Turkish bathhouse, Iznic, Turkey
Ottoman period

11. Open Air School, Amsterdam, Netherlands
Johannes Duiker, 1930

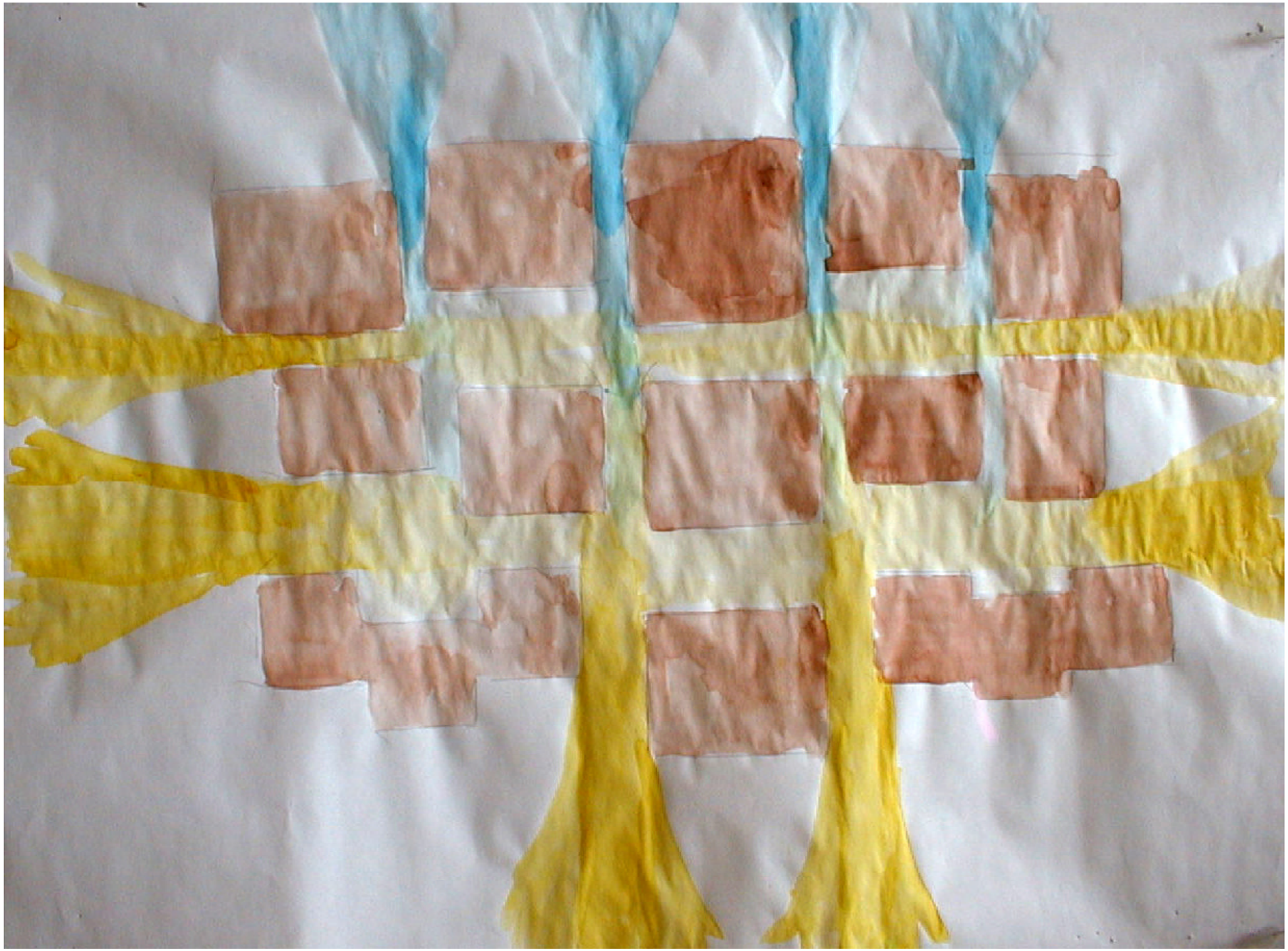
12. Library, Exeter Academy
Exeter, New Hampshire
Louis Kahn, 1968

we use for electric lighting, and can therefore decrease our impact on the natural environment.

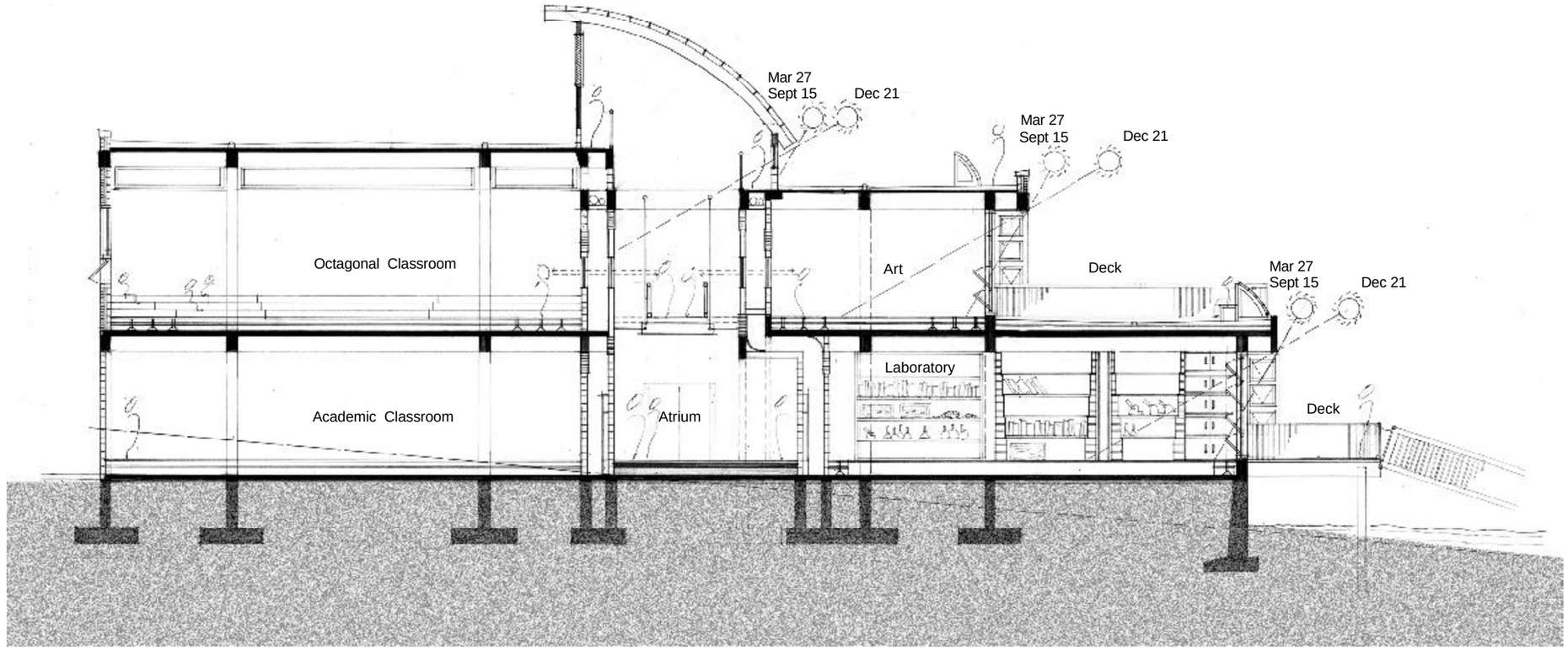
The Sun School is designed to maximize natural lighting through it's primary orientation to the south. The use of skylights over the entry spine, atrium, library, and greenhouse, clerestory windows in the gym, full glazing areas on the south facade, extension of the laboratories and classrooms to the outdoor decks and pond, and significant glazing on the North facade all contribute to natural lighting. A student is thus connected to the outdoors in being able to see the pond, the sky, and the hills in the distance. Students can stretch beyond the confines of the classroom to gain a perspective and reflect on what they are doing. They can make a connection to the natural environment. The Architecture of the Sun School permits and encourages this connection. Inside the school sunlight striking the atrium wall through the photovoltaic skylight, and producing light and shadows from the south facing doors can provide visual and tactile delight.

The outdoor decks on the southern edge of the building offer not only natural light but total exposure to the outdoors. They are a forum for relaxing, socializing, reading, and directly observing the natural environment. They are a direct extension of the indoor classrooms. From here the weather, bird behavior and migration patterns, freezing and thawing, and the effects of sunlight on the pond, can be studied. The laboratory students and the art students can collaborate, lab students collecting specimens from nature, and art students sketching, drawing and painting them. The pond and the hills can also make wonderful subjects to draw or paint.

Hopper and clerestory windows on the school's north facade admit natural light to the north facing classrooms, including the Octagonal classroom. Trellis areas on the decks, at the pond terminus of the entry spine, and at the pond perimeter provide shaded places to sit, socialize and observe nature. The indoor plaza, entry spine steps, and the first floor atrium sitting areas provide a more climatically controlled, but still dynamic, place to be. All these places help create a sense of community in the school. The indoor plaza in particular can be a central gathering place for the students and faculty, as well as community members attending daytime or evening events in the gymnasium or multipurpose room.



Preliminary light study, water color



SECTION 4

Sun Study

The south side of the school is a series of outdoor decks, laboratories and classrooms with full height doors with operable windows. Sunlight is permitted into the rooms from September 15 through March 27, the period in Blacksburg when sunlight is most needed. On December 21, the shortest day of the year, the maximum amount of sunlight enters the rooms. From March 27 through September 15, the period in Blacksburg when sunlight is least needed, the rooms are shaded by a three foot roof cantilever.

January 28

View from first floor laboratory toward deck, pond, and hills beyond. Shadows and sunlight can provide visual and tactile (heat) delight to the students and faculty.

January 28

View from second floor art classroom to deck, pond & hills

January 28 View of second floor and atrium. Sunlight and shadow can provide visual delight.

January 28 View of first floor & atrium

View to second floor academic classroom

Ventilation louvers, though vertically staggered, establish a small opportunity for atrium natural light to pass to the classrooms. Vertical staggering also inhibits sound penetration through the cavity wall.

View to first floor academic classroom

The cavity wall between the classroom and the atrium admits natural light to the classroom via a double glazed opening, thus establishing a visual connection between the two.

January 28, 1p.m. View to the second floor north facing octagonal classroom

Clerestory windows surrounding the octagonal classroom admit natural light, and frame a view to the sky and the photovoltaic atrium roof.

January 28, 1p.m. View to north facing academic classrooms

Hopper windows admit natural light to the academic classrooms on the north side of the school

Natural light extends well into the laboratories and classrooms

January 28

View to the second floor art classroom from the deck