

# LEARNING FROM EARTH

AN EXPLORATION AND  
REINTERPRETATION  
OF VERNACULAR  
BUILDING



**CAITLIN MARTUSEWICZ**

Cooper Union, UNITED STATES  
Dr. Toby Cumberbatch

PROVOCATIONS TO ACT: ...

THE BEAUTIFUL...

THE TIMELESS...

THE IMPORTED...

THE MINIMAL...

THE SUSTAINABLE

THE TRADITIONAL...

THE PRACTICAL...

...MOMENTS  
OF  
AFRICAN  
ARCHITECTURE

THE INDIVIDUAL...

THE STRUCTURAL...

THE VERNACULAR

THE CONSERVATIVE...

THE PIONEERING...

THE EVOLUTIONARY...

THE COLLECTIVE...

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**EXPERIMENTATIONS:** IN THE SPIRIT OF SUSTAINABILITY, SIMPLICITY AND INTELLECTUAL EXCHANGE WE SEEK A BETTER UNDERSTANDING OF THE CULTURAL AND PHYSICAL IMPLICATIONS OF VERNACULAR ARCHITECTURE; THE BUILDING TECHNIQUES, MATERIAL CHOICES AND SOCIAL RAMIFICATIONS MOST COMMONLY LINKED WITH POVERTY. WE LOOK TO THE NATURALLY PROVIDED, READILY AVAILABLE, AND INEXPENSIVE MATERIALS OF NORTHERN GHANA TO INSPIRE, RATHER THAN CONSTRAIN AN ONGOING SERIES OF EXPERIMENTS TO ADDRESS THE BASIC UNIT OF INHABITATION. PRESENTED HERE IS GHANAIAN STUDENTS 2007 TO THE WORK OF AND AMERICAN FROM SUMMER PRESENT.

**CHALLENGE:** TO DEVELOP A ROOFING SYSTEM INSPIRED BY TRADITIONAL CONSTRUCTION METHODS, CAPABLE OF REPLACING THE ZINC-SHEET ROOF THAT IS BECOMING BOTH AN UNFORTUNATE NORM AND AN ECOLOGICAL EYESORE. TYPICAL ZINC CONSTRUCTION, THOUGH LESS LABOR INTENSIVE, FAR EXCEEDS THE COST OF THE TRADITIONAL FLAT ROOF AND IS OFTEN POORLY UTILIZED WITHOUT REFERENCE TO THE MATERIALS OR THE FORMS THAT HAVE EVOLVED MORE NATURALLY. RATHER, THE MATERIAL, THE STYLE AND THE METHODS ARE TRANSPLANTED. OUR ASPIRATIONS ARE TO RE-INHABITANT/BUILDER WITH THE POTENTIAL OF LOCAL POSSIBILITIES. REALIZE THE TOLL A TRADITIONAL ROOF HAS ON ALREADY THINNING FORESTS. ITS CONTRIBUTION TO DESERTIFICATION IN SUB-SAHARAN AFRICA. AS BOTH OF THESE OPTIONS LEAVE SOMETHING TO BE DESIRED, WE CHOSE TO ENTER THE DIALOGUE OF MORE EFFICIENT HOUSING HERE.

**PROCESS:** THROUGH EXPERIMENTS CONDUCTED AT THE COOPER UNION A SYSTEM OF LAYERING, LIKE THAT FOUND IN THE TRADITIONAL FLAT ROOF, OF PROGRESSIVELY SMALLER SECTIONS OF BAMBOO TOPPED WITH A CEMENT STRENGTHENED MUD MIXTURE HAS AN OPTIMAL STRENGTH TO MASS RATIO. THIS ROOF TYPE IS PRESENT IN BOTH EXPERIMENTS. THE LOAD OF THE FOUR MAIN STRUCTURAL BAMBOO BEAMS IS ACCEPTED BY CEMENT-REINFORCED BRICKS, CREATING A TYPE OF HIDDEN COLUMNAR SYSTEM; INTEGRATED WITH THE NON LOAD-BEARING MUD BRICKS. PLASTER FOR WALLS PROTECTED BY OVERHANGS OR VEGETATION IS A COMBINATION OF DUNG/FINE SAND/ SIFTED LATERITE. WALLS EXPOSED TO PREVAILING WINDS ARE PLASTERED WITH THE SAME MIXTURE STRENGTHENED WITH A SMALL AMOUNT OF CEMENT. BAMBOO SHUTTERS AND DOOR TO FINISH. CRAFTSMANSHIP AT THIS POINT WAS POOR BUT THE CONSTRUCTION PROCESS PROVOKED A REALIZATION OF MANY POSSIBILITIES OF TEXTURES AND LIGHTING CONDITIONS THAT BAMBOO CAN CREATE.

**THE EXCHANGE:** STUDENTS FROM THE U.S. BEGIN TO OF BUILDING IN AN ECONOMICALLY AND ECOLOGICALLY NECESSITY OF CONSERVATION. OUR GHANAIAN PEERS SOME LEARNING CONSTRUCTION ALONGSIDE US.

UNDERSTAND SUBTLETIES HARSH ENVIRONMENT, THE DRAW THEIR OWN IDEAS. LONG DAYS OF WORKING TOGETHER GENERATED AN ENVIRONMENT OF INFORMAL DISCUSSION, TRUST, RESPECT, AND EVENTUALLY CAMARADERIE. A JOINT STRUGGLE BUILT UNDERSTANDING.

THE SITE PLAN



