ENGINEERING

Modules for Buildings

➤ ARCHITECTS ARE now taking a few pointers from Junior who builds his fortresses with blocks.

Houses of he future may all be built using a four-inch cube called a module as the structural "atom." It is estimated from structures already built with this method that industry would save billions of dollars a year by fully adopting the system.

In conventionally designed buildings, the architect draws the blueprints using feet, inches and fractions of inches. When construction begins, carpenters, plumbers and bricklayers have to cut and patch their non-standardized materials to make them fit.

The new system of modular measure would eliminate this waste of time and material by making use of building materials that are standardized to the four-inch cube. Thus, when the workers follow a blueprint scaled to the module all the parts would automatically fit.

Modular windows, for instance, would slip right into the opening of modularly scaled walls built of modular bricks.

The system was approved by the American Standards Association in 1945 and, since 1950, use of the method has steadily grown.

William Demarest Jr., modular coordinator of the American Institute of Architects in Washington, said that today 90% of all concrete blocks and all the glass blocks are made to modular measure.

For most efficient operation of the system, he said, all building materials would have to be manufactured to this four-inch cube measure, but there are advantages even if materials are off-size.

"The worst that would happen is that workers would have to cut and patch certain areas which they do now anyway," he said.

Mr. Demarest said that when the building industry has completed conversion to modular measure there will be a saving of billions of dollars a year in decrease of wasted materials and greater construction speed.

Contractors, builders and draftsmen met in Washington under the auspices of the Building Research Institute of the National Academy of Sciences to discuss methods of developing the system.

James Coombs, president of Baker and Coombs, Inc., general contractors in West Virginia, said that his firm had recently completed six large buildings using modular measure. He reported savings of up to 50% in time needed to cut materials, up to 35% in layout time, and savings up to 10% in cost of masonry labor.

The system was proposed in 1936 by Albert F. Bemis, a Boston industrialist, to standardize building procedure and to reduce the cost of housing.

Science News Letter, January 1, 1955

EVOLUTION

Evolution of Limbs

➤ ARMS AND legs may have come about in the evolutionary development of animals because fishes needed a more efficient means for digging into moist places to survive during hot, dry weather.

This possibility in explaining the reason for the original adaptive significance of the limb of four-legged animals or tetrapods, is reported in *Science* (Dec. 17).

Dr. Grace L. Orton of the Scripps Institution of Oceanography of the University of California states that, in particular, the foot, which has always been the most difficult part of the limb to account for, can be understood most easily if it is interpreted as originally a digging specialization.

The California zoologist reports that there is evidence to indicate that ancient fishes, especially during the Upper Devonian period about 300,000,000 years ago, would have found it an "inauspicious time" to emerge as land animals from aquatic animals.

"The prospective new environment would then be at its worst for such animals, and it would be much more likely to select adaptations that would permit more effective direct use of available water supplies," Dr. Orton states.

The development of the fin into a foot-like structure would permit the fishes to remain in contact with the retreating moisture during the Upper Devonian period, which was both a dry era and the time in which amphibians first appeared.

A digging limb would thus make it possible for the proamphibians to remain "in the vicinity of established seasonal water holes rather than wandering off into a hostile environment," the scientist states.

Heretofore, it has been usually thought that the tetrapod limb was an adaptive modification that was directly useful for land locomotion.

Science News Letter, January 1, 1955

CHEMISTRY

Natural Insecticide Found in Flower's Roots

➤ A HIGHLY pungent, natural insecticide has been derived from the roots of the American coneflower, which grows wild in Kansas, Nebraska and Missouri.

Designated echinacein, a description of the compound's isolation and its insecticidal qualities in tests with houseflies is reported in *Science* (Dec. 17) by Martin Jacobson of the U. S. Department of Agriculture's entomology research branch, Beltsville, Md.

The entomologist stated that the echinacein possessed moderate insecticidal activity, along with the characteristics of pungency found in a number of other insecticidal unsaturated isobutylamides derived from natural sources.

An accidental contact of a trace of the new compound, which was formed into acids through permanganate oxidation, caused a burn on the skin of the hand that blistered and then peeled after two days.

Because the echinacein is highly unstable, attempts to identify it further failed. However, Mr. Jacobson reported that the pungent natural insecticide may be identical with another compound derived from the bark of the Herculesclub, sometimes called the toothache tree.

A small amount of the new compound, when placed on the tongue, causes a numbing effect.

Science News Letter, January 1, 1955

ENGINEERING

Longer Car Fronts May Decrease Crash Deaths

➤ CAR DESIGNERS might decrease the death toll from head-on collisions by putting trunk space behind the engine.

This was one of the conclusions of tests, conducted by University of California scientists, in which cars with dummy drivers were smashed into a reinforced log barrier. Results were recorded by instruments in the car and by a slow motion movie camera aimed at the collision point.

The experiments, which are reported by the Highway Research Board in "Highway Accidents and Related Factors," showed that less than one-third of the initial jolt was absorbed by the car frame. Under severe impacts the auto responds as a somewhat flexible structure.

Putting more car structure between the front bumper and the driver might increase the absorption of the impact, the report said.

The tests were run by D. M. Severy and J. H. Mathewson of the University of California engineering department.

Science News Letter, January 1, 1955