hardy hybrids. But we do not give them a chance, on their own.

Wild animals we serve with equal lack of enterprise. Our forgotten Neolithic grandsires tamed intractable wild horses, cattle, sheep, swine. They at least made captives of goats and camels —those two can hardly be called tamed or domesticated even yet, after ten thousand years in the corral.

But we, with deer, elk, antelope, bison, and swarms of other valuable mammals, and with our supposedly superior mental resources, can do no better than kill them wholesale. Our even more remote ancestors of the Old Stone Age could do that; and even they killed only for meat, not for the "fun" of seeing a victim fall kicking, or for the bragging vanity of mounting his stuffed head on the wall.

Is it any wonder that our poor beasts eye us with bewilderment, and sometimes with something that looks uncomfortably like a mild contempt?

Science News Letter, February 29, 1936

ENGINEERING

Harvard Ice Studies Show How Frost Destroys Roads

HUGE economies, through the construction of improved frost-resistant highways, are expected to result from important discoveries concerning frost action in soils, which have been made by Prof. Arthur Casagrande of the Harvard Graduate School of Engineering.

Outstanding among his findings in this pioneer research is that engineers have greatly underestimated the tremendous ice pressures that form beneath highways in winter, causing the roads to heave and crack.

He found, for example, that the pressure exerted by crystallizing ice against the soil in which it is confined is not constant for all freezing temperatures, as has been heretofore believed, but increases in proportion to the amount the temperature falls below the freezing point. Thus at low temperatures tremendous ice pressures, far exceeding those expected under the old theory, form beneath the highways. If the freezing is sufficiently slow, it was found, ice layers may continue to grow indefinitely.

The experiments were conducted in a special "cold room" laboratory for soil research, which Prof. Casagrande installed at Harvard last year. In this laboratory, one of the finest of its kind in the world, natural ice action in soils can be imitated and controlled at will.

The research was undertaken after Prof. Casagrande had participated with the United States Bureau of Public Roads and the New Hampshire State Highway Department in field observations. In many instances roads were found to be heaved six inches beyond expectations and under extreme conditions the heaving exceeded a foot. This led Prof. Casagrande to the belief that in certain soils the water in the voids will not merely freeze but that ice crystals will continue growing, gradually forming layers of considerable thickness.

"It is this additional water, segregated in form of ice, which causes heaving resulting in an uneven road surface," Prof. Casagrande has explained. "Irregular heaving causes concrete pavements to break and in severe cases may lead to their destruction. During the spring thaw the liberation of large quantities of water brings about a supersaturation of the soil, which becomes so very soft that it affords insufficient support for heavy traffic loads. In this condition macadam and oiled gravel pavements may be completely destroyed by truck traffic.

"In clean sand and gravel we have found no growth of ice layers, either in field or laboratory observations. Such materials are, therefore, used extensively in highway construction in form of a thick foundation, in places where the underlying soil would cause serious trouble if it were penetrated by frost to any considerable depth.

"The use of insulating materials is being considered to prevent deep frost penetration beneath modern pavements. The question of finding an efficient and economical method of insulating subgrades against frost penetration is also being investigated in the Harvard laboratory."

Science News Letter, February 29, 1936

MEDICINE

Uncle Sam to Save Leper's Baby From Dread Disease

ONE BABY whose mother is a leper is going to be saved from the stigma of being born in a leper colony. Uncle Sam is playing godfather in a very practical way to this as yet unborn infant, whose name will never be disclosed. The child will also be saved from contracting the disease that afflicts his mother.

The mother, a leper, was treated at the federal leprosarium at Carville, La., and was apparently cured, or as the doctors put it, the disease was "arrested." She was allowed to return, on parole, to her husband and home and there led the life of a normal married woman.

After a few years, however, fresh signs of leprosy appeared and the woman — whose name is also a secret known only to the officers of the U. S. Public Health Service—returned to the Public Health Service hospital for lepers at Carville. There it was discovered that she was to become a mother.

She is now undergoing treatment again, but when the time comes for her child to be born, she will be taken, under special precautions, to another hospital. As soon as the child is born, he will be taken from his mother and cared for in the nursery of this general hospital, just as any other child would be. When he is old enough to travel, he will be taken to his mother's family.

Science News Letter, February 29, 1936