

late quantities of dust. A well-known New York physician, who has had occasion to observe this fact, has abolished curtains altogether in his house, and moderation in their use is recommended.

Dr. Richardson objects to houses built

in the Queen Anne style, because of their insufficient light. Those who occupy them live in shadow, and he calls their small windows, overhanging cornices, and sharp small pitcher roofs, enclosing attics with windows, an "architectural perversity."

PREDISPOSITION, IMMUNITY, AND DISEASE.

BY W. BARNHARDT, IN THE POPULAR SCIENCE MONTHLY, JANUARY, 1891.

IT is a generally recognized fact that whole classes and families of animals, as well as single individuals, frequently are liable to succumb to some influence apparently obnoxious to health, while others, although exposed to the same danger, proved exempt from such injury. This experience concerns the action of vegetable and animal poisons, as well as the attacks of the various diseases to which flesh is heir. Destitute of a satisfactory interpretation of these divergences, we have recourse to the expression "predisposition" for explaining the inability of offering resistance to the foe—a word which does not actually explain the matter, but furnishes a convenient term. Germs of disease are to be found every where, but only predisposition permits its development. Immunity, on the contrary, is the condition of the system which prevents an outbreak. The fundamental cause of this condition is as little known as the cause of predisposition; only in a few cases have we been successful in tracing it back to certain chemical and physiological processes occurring in the body.

The action of carbon monoxide on different animals affords a suitable instance of what is called immunity, and illustrates the kind of circumstances on which it may sometimes depend. Carbon monoxide is an air-like compound, which is contained to a large amount in the illuminating gas produced by the decomposition of steam by red-hot coals, and to the presence of which the poisonous qualities of this gas are chiefly due. A mixture of one part of carbon monoxide and ninety-

nine parts of common air, when breathed, will in a short time kill any of the warm-blooded vertebrates. Cold-blooded vertebrates, such as frogs, can for a considerable length of time stand the exposure to such an atmosphere; arthropoda or insects are not in the least affected by it—they possess immunity from it. Searching for the cause of these differences of effect, we find it to be the tendency of hæmoglobin, the albuminous matter constituting the red corpuscles of the blood, to combine with carbon monoxide. In the process of respiration in warm-blooded animals hæmoglobin takes up oxygen, which thereafter, as a necessary agent in the exchange of matter, is delivered to the different organs of the body. Carbon monoxide prevents the absorption of oxygen, being absorbed in its place; but, unfit as it is to replace oxygen in its vital functions, it causes serious derangements, which end in suffocation. In cold-blooded vertebrates respiration is of more subordinate importance; although as well as in warm-blooded animals, it consists in absorption of oxygen by hæmoglobin, the need for oxygen is much lower; a frog can live for a considerable time without the accession of air. Hence the effect of carbon monoxide is a much slower one. The blood of insects contains no hæmoglobin; carbon monoxide is not absorbed by it, and is not a poison to them, provided that a sufficient amount of oxygen is always present. Carbon monoxide, consequently, acts as a stronger poison upon warm-blooded animals; its effect is weaker in cold-blooded vertebrates; and insects are proof against its effects.