unclothed with the financial power of capital, the scientific worker and investigator will often find himself likely to lose job and prestige if he "knows the truth" and lets others know that he knows it. In countries nearer the breaking point than ours, he may find himself in jail or worse.

Scientists the world over are aroused with the fear that scientific progress may be losing the race with social instability. They see disease, poverty and war shackling the human mind and spirit. They have a vision of what the scientific spirit and human understanding could bring to the world. Scientists are so few numerically, yet given a rallying point they might be the leaven that will cause the world to rise from its social despondency.

Science News Letter, June 12, 1937

PHYSICS

Wallpaper Patterns Linked To Atoms in Study of Design

LYING abed, sick or wakeful, in a room papered in a prominent pattern may lead one to believe that the ways a wallpaper pattern can be varied are limitless.

Take it from those who know—not wallpaper manufacturers but crystallographers of the Massachusetts Institute of Technology—that there are only 17 different ways in which the basic design can be repeated on the paper.

This science of design is a sort of by-product of a more intricate task, the study of crystal structure. Each crystalline compound in chemistry is a structure of atoms. The tiny crystals, whose atoms can be detected only by powerful instruments, can be thought of as three-dimensional wallpaper. In three dimensions, or space, patterns can be arranged in 230 different ways, as contrasted with the 17 of repeating a given motif on a plane or two-dimensional surface.

The more complex problem of crystal structure is important in understanding nature's or man-made chemical compounds so useful in medicine, industry, and other fields. In these compounds the atoms composing them may be as close together as one ten-trillionth of an inch. Scientists studying photographs of X-rays diffracted by crystals, which reveal the patterns, must be able to measure to one five-hundredth of an inch on the photographic film.

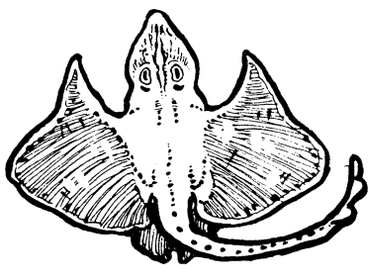
The two-dimensional patterns are not confined to wallpaper. They may be found in neckties, dresses, tiling, textile weaves, prints on linoleum, carpets, etc. Professional designers and those who like to work out such puzzle problems just for the fun of it will be interested in studying the article about wallpaper and atoms that appears in the *Technology Review* (June 1937) written by Prof. M. J. Buerger and J. S. Lukesh.

Science News Letter, June 12, 1937

A nail driven into a tree four or five feet above ground will not "grow up" with the tree, but will remain at that height however tall the tree becomes.

ICHTHYOLOGY

NATURE RAMBLINGS by Frank Thone



Shark Curiosities

SHARKS have swum the world's waters for well over a third of a billion years—since Silurian geologic times. They have been a successful family from the start—numerous as individuals, prolific in the evolution of new species, aggressive, adaptable.

Sharks, like all other fishes, have numerous species in what might be called the standard fish form: streamlined body with its greatest diameter well forward of amidships, a flaring tail, moderate-sized fins. A form like trout or codfish or carp.

From that form, however, they vary in all sorts of ways. Just as the higher fishes have produced the long and snaky eel, so also there is an eel-shaped shark. It is an exceedingly rare fish, first found in Japanese waters and since discovered in a scattered few places in the warmer seas.

Then there are the flat-bottomed sharks, that habitually lie on the bottom like flounders, except that they are flattened in the opposite direction and lie on their bellies instead of their sides. Of such are all the skates and rays, including the vicious stingrays and the stingless but portentously huge devilfish or manta of the tropic seas.

One of the strangest of these is a creature that has the wide side-extensions of its body partly supported on a pair of arm-like extensions, so that they look almost like wide sleeves. With its pointed head projecting between them like a bishop's mitre, this shark so impressed an early French naturalist that he described it as "a sea monster in the robes of a bishop."

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