University points out that physical chemists today represent their energy relations between molecules by energy diagrams which resemble the contour maps of a mountainous country.

He adds that the interchanges in the population of people separated by a mountain range are determined by the number of people in each community, by the height and character of the roads leading over the mountains and by the mountain climbing ability of the natives.

"The higher the mountain pass, which is the same thing as saying that the molecules require a large energy of activation to react, the fewer are the interchanges. The more roads that are constructed over the mountain pass the more easily it can be traversed."

Until recently chemistry's only way of getting "over the mountain" was to make the molecules energetic by heating them, or to prevent them from reacting by cooling them, Prof. LaMer states.

New knowledge of the role of chemical catalysts is, however, showing that molecules can be drawn together (overcome the barrier wall between them) by the presence of electrical charges on the catalysts. Thus two molecules having positive electric charges dislike to react because the like charges repel one another. If a catalyst with a negative charge is placed near them the attractive force helps bring the two incompatibles together and may make them react.

Catalysts, in effect, provide new "pathways" across the barrier "mountains" among molecules. "Definite proof of the existence of this new kind of 'mountain pass' will have its applications throughout the whole of the chemical world," Prof. LaMer states.

Science News Letter, July 29, 1939

PHYSIOLOGY

Window Lets Scientists Look Into Chest

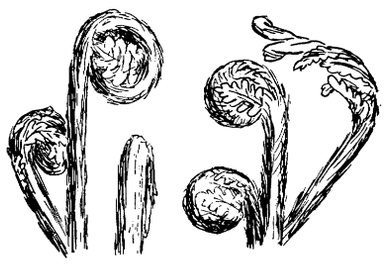
A GLASS window in the chest which lets the scientist look inside and observe the lungs as they breathe air in and out has been devised by Dr. Robert J. Terry of Washington University at St. Louis. A moving picture has been made through the window and in describing the construction of the window (*Science,* July 14) Dr. Terry promises reports of studies made through the window.

Science News Letter, July 29, 1939

The Pacific Ocean covers more area than all the earth's land put together.

PHYSIOLOGY

NATURE RAMBLINGS by Frank Thone



Spirals in Nature

THE SPIRAL is one of the commonest patterns in living nature. It seems to be one of the easiest outlines for life to trace.

Familiar examples will occur to any one almost instantly: snailshells, the way water whirls in an eddy, the twining of a beanstalk around its support. So striking is the pattern of the first of these examples that the Greek word for a snail, *Helix,* means a spiral.

A very little additional searching will disclose the pattern, existing everywhere under the thinnest of disguises. What seem to be the concentric rings of thread in an orb-weaving spider's web are really spirals, starting at the center and gradually widening toward the outside. As a rule the spider spins two such spirals for the web, completing one and then returning to the center to start another.

Almost all common plants have the spiral pattern worked into their bodies in one place or another. Take a twig of a tree, like elm or apple. Trace a line on its bark from one leaf to the one next above it, then to the one above that, and so on. You will find you are working around the twig, in a spiral. The uncurling "fiddlehead" of a young fern leaf is another familiar plant spiral.

Watch a soaring bird, like a hawk or a buzzard, as it sails around in the air watching something below that interests it—usually a possible source of a meal. We commonly say that the bird is "circling"; but if you will wait longer and watch carefully you will see that it is really tracing a wide spiral path through the air.

The spiral seems to be the basic pattern of the universe itself, for we have learned in recent years that the marvelous astronomical patterns called spiral nebulae are really vast aggregations of stars, millions of suns like our own, or even larger, rotating around a common center in a vast spiral dance.

The earth and all the planets, as they move about the sun, trace spirals. True, it is commonly stated for convenience that the planets revolve around the sun in elliptical paths. But the sun also is moving, so that when a planet gets to the end of its annual ellipse, it is millions of miles from where it started. The ellipse has been broken open and pulled apart—into a spiral!

Science News Letter, July 29, 1939

BIOLOGY

Findings May Speed Making of Fat From Sugar

A PRACTICAL way of causing yeast cells to manufacture fat from sugar and other carbohydrates may be brought closer to realization by experiments reported by Dr. Theodore J. B. Stier of Harvard's Biological Laboratories.

Knowledge of the intracellular processes of human tissues may also be advanced markedly as a result of his studies on the allied cell-life of baker's yeast.

Particularly significant is his finding that yeasts deficient in vitamin B fall behind in production and storage of animal starch or glycogen. The tests reported are the first ever made in which yeast cells have been kept in an alcohol or sugar bath of constant concentration, an important factor if any implications are to be drawn for the animal cell.

The research dealt quantitatively with the diet of yeast cells and their manufacture of glycogen and fat. For this reason it may also help future perfection of a yeast process for making fats, first utilized by Germany during the World War.

Dr. Stier has confirmed previous findings that yeast forms fat when fed sugar or alcohol. He found that alcohol aids conversion of its stored carbohydrate to fat and that more fat is stored on a diet of both alcohol and sugar. Yeast without food or oxygen goes into suspended animation. This discovery may permit storage of yeast.

He found that the concentration of vitamin B falls if yeast is deprived of food but not oxygen. Ability to produce this deficiency may be useful experimentally. Starved yeast cells fed glucose but no oxygen, store glycogen and produce much alcohol but little fat.

On glucose plus oxygen, deficient yeast makes glycogen but a short time, whereas normal yeast on this diet continues faster production longer.

Science News Letter, July 29, 1939