

the drug in checking cell division at one particular point in its progress had been studied and reported on by a number of men, working mostly on animal cancers. Possibilities in turning this behavior to account in artificially producing cells with increased chromosome counts (and hence new genetic properties) suggested themselves to certain French investigators and simultaneously to the Nebels and to Dr. A. F. Blakeslee of the Carnegie Institution of Washington. They did their work independently, and published results al-

most simultaneously in the journals. Now all plant breeders are using colchicine. Some of them have produced plants which promise to be of considerable economic value.

The illustration on the cover of this number of THE SCIENCE NEWS LETTER is from a photograph of one of the Nebels' colchicine-produced marigold varieties. The improved tetraploid flower is contrasted with one from a plant of the original parent variety, shown at lower right.

*Science News Letter, May 25, 1940*

## BIOLOGY

# Food Made Without Sun And Without Chlorophyll

**One-Celled Water Organism, Chilomonas Paramecium,  
Can Also Grow and Reproduce on Only Inorganic Salts**

**M**AKING food substances (starch and fat) without chlorophyll and in the dark, rated as a biological impossibility by all accepted standards, is a regular performance of a one-celled water organism known scientifically as *Chilomonas paramecium*. Not only that, but *Chilomonas* can make food, grow and reproduce in a solution containing only inorganic materials, Prof. S. O. Mast of the Johns Hopkins University told fellow biologists at the meeting of the Eighth American Scientific Congress.

In Prof. Mast's experiments, single individuals of this microscopic aquatic species were isolated and kept in bacteria-free drops of water in hollowed microscope slides. Rate of growth was determined by the rapidity of reproduction by division. Starch grains and oil droplets could be seen through the transparent body substance of the tiny creatures.

*Chilomonas* can form food in light as well as in darkness, Prof. Mast reported, but he found that starch accumulated in its body more rapidly when it did its work in the dark. It can use organic substances if they are present, but it can get along perfectly well with only inorganic salts and carbon dioxide.

Increasing the amount of carbon dioxide in the atmosphere in contact with their tiny watery world enables the organisms to produce more food, and up to a certain point also to divide more rapidly. At the highest carbon dioxide concentrations reproduction stopped. Non-reproducing *Chilomonas* individuals, however, were found to be more

heavily stocked with starch than the others.

*Chilomonas* belongs to the primitive group of organisms known as flagellates, which occupy a position near the bottom of the evolutionary ladder. Botanists and zoologists have sometimes disputed whether they are really plants or animals. They have been known to science for a long time, for they are extremely common. But until now the ability of this animal-like species to do a plant's work and make food out of inorganic substances—and without the supposedly necessary tool, chlorophyll, at that—has never been suspected.

*Science News Letter, May 25, 1940*

## GEOGRAPHY—MILITARY SCIENCE

**Alaskan Defense Can Be  
Learned from Finland**

**A**MERICA can learn vivid lessons in Alaskan and Canadian defense from Arctic battling in the present European war, in the opinion of Dr. Vilhjalmar Stefansson, noted Arctic explorer, in Washington to consult with government officials on Arctic problems.

As a scientist concerned with geographic and climatic problems of the Far North, Dr. Stefansson said that a huge area of the world's surface is country where warfare—if and when it comes—must be on the Arctic and sub-Arctic plan. And as the course of military power is steadily moving northward, and has been for several thousand years,

he points out, understanding Arctic conditions becomes increasingly vital.

"A vast area where wars will be winter wars exists in Alaska, Canada, northern Europe and Siberia," said Dr. Stefansson. "This coincides roughly with the area where the subsoil is continually frozen. Where the land is flat or rolling, incredible numbers of lakes form in such conditions, interspersed with thick forests.

"In summer, mechanized units cannot make progress in such country. But in winter, the rivers, such as Alaska's Yukon and Canada's Mackenzie, become broad ice boulevards into the heart of the country. And the innumerable lakes frozen over and linked by stream channels can be traversed by troops moving from one to another, guided by maps or by airplanes."

If well defended, all such countries can hold off invaders by the type of fighting the Finns did from the forests, lying in ambush for the invading army, exposed to attack on the expanses of the ice. If, however, invasion is not opposed, the lakes and rivers of Far Northern areas provide opportunity for amazingly rapid advance of mechanized troops, Dr. Stefansson points out.

Greenland, he explained, is an exception, in which this type of fighting would not work. The fringe of land surrounding the enormous central ice cap

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of Greenland is mostly mountainous, except in Pearyland in the north, and Greenland has few areas with the type of flat lake-dotted terrain of Finland and large areas of Alaska and Canada.

"Greenland's whole center ice cap pro-

vides excellent emergency landing fields for airplanes," Dr. Stefansson states. "This region used to be mistakenly rated a danger zone. Actually, it is a zone of safety."

*Science News Letter, May 18, 1940*



GEOGRAPHY

# Fate Of 60,000,000 Natives Hangs On Belgian And Dutch

## Belgium's Foreign Domain Is Concentrated in Africa But Holland's Lies in West as Well as in East Indies

**F**ATE of nearly 60,000,000 natives in Belgian and Dutch colonies hangs in the balance as a result of German invasion of the two mother countries.

With Belgium and Netherlands caught up in Europe's total war, "protection" of large and important holdings in Africa, East Indies and America creates a new international problem. Queen Wilhelmina's domain includes islands and South American mainland only a few hundred miles from the Panama Canal.

Concentrated in Africa, Belgium's foreign domain consists of the Belgian Congo, a million square miles of equatorial territory rich in copper, rubber, cotton, cocoa, palm oil, and gold. Eighty-five times the size of Belgium itself, this vast possession is surrounded by holdings of Portugal, France, and Britain. Its coast is a mere 25-mile strip along the Atlantic.

Besides this valuable Congo colony, Belgium is responsible also for an adjoining corner of Tanganyika, a portion of Germany's former colonies assigned to Belgian mandate after the World War. Britain, which ceded this area to Belgium in return for World War assistance, has exchanged economic advantages there with the Belgians and would be most concerned over any change in its status.

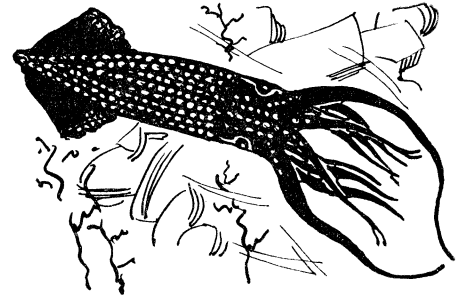
More scattered but totaling an almost equally impressive area, the Netherlands colonies are all in the tropics; and, with the one important exception of Dutch Guiana in South America, the Dutch colonies are islands. Small Holland in Europe controls some 50,000,000 Japanese, Balinese, Sumatrans, and other natives of the East Indies.

The Netherlands holds a large part of New Guinea, one of the world's largest islands, and one which the Dutch have until recently been content to hold without intensive exploitation. Fear of Japan's encroachment on the East Indies is seen as the reason for Dutch activity to plant rubber, coffee, and kapok in New Guinea and to demonstrate a concern for using, as well as holding, the land.

In the shadow of the Monroe Doctrine, and short flying distance from the Panama Canal, lie the Dutch West Indies consisting of several islands off Venezuela, also the mainland colony of Dutch Guiana, in South America.

Holland's colonies figure in world trade in such valuable lines as tin, rubber, oil, quinine, spices, indigo, sugar, coffee, and tea.

*Science News Letter, May 25, 1940*



Living Lanterns

**O**CEANIC abysses and other sunned parts of the world are not wholly without light. In these dark places there are numerous creatures that carry their own lanterns, and have eyes sufficiently sensitive to see by this dim light of their own providing. These carriers of cold light are described in a new book by Prof. E. Newton Harvey.

Not only in the ocean's depths but also in our own upper world of air and earth are there nocturnal creatures that light their own dark ways. Almost every large class of animals, and two great groups of plants, have representatives in the shining ranks reviewed by the Princeton biologist. Bacteria, fungi, protozoa, jellyfish, up to insects, squid and fish, all are represented.

Some, like the bacteria, have no way of turning their light on or off, and so shine with a constant glow, but most of them either flash at more or less determinable intervals (like the familiar fireflies) or burst into a glow when disturbed, like the one-celled animals that swarm in the sea during periods when the water "burns" at night.

There are certain forms without "power-plants" of their own that make use of the light-producing powers of smaller creatures, notably bacteria. One remarkable case which Prof. Harvey describes is that of two related genera of tropical fish. Below each eye, in these fishes, is a light organ apparently specially designed for growing masses of luminous bacteria. This organ has a rich blood supply, opaque screens to protect other tissues of the fish from the light, and a mechanism for turning the light on and off.

Not always, however, is the presence of luminous bacteria beneficial to the ani-

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