THE TERRIBLE THREAT
OF NERVE GAS

By JOHN KOBLER

Workers at Edgewood Arsenal's Toxic Agent Tank Site collect samples which measure nerve gas concentrations at various heights. Despite progress in developing an antidote, no system of instant detection exists.

The fascinating story of our search for a way to counteract the only weapon that may be worse than the H-bomb.

A daring experiment on human guinea pigs can be performed in the not-too-distant future by United States Army Chemical Corps at Edgewood, Maryland. A group of Army personnel, headed by director of research Dr. Walter Sumner, will deliberately expose themselves to nerve gas—the deadliest known chemical warfare weapon—which paralyzes the nervous system.

Nerve gas was invented and manufactured in large quantities by the Germans during World War II, though never used, and is being stockpiled by both the United States and Russia. It might well be the weapon of an enemy planning to occupy a city and quickly and invasively, the vapor from the gas can kill in four minutes. Under optimum conditions, with a brisk wind blowing across a level, guided missiles containing the gas probably destroy 90 per cent of all life in an area of many square miles.

Christopher Gadsby, who is an authority on chemicals, plays the role of a deadly spectator in nerve gas.
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A daring experiment on guinea pigs will be performed in the not-too-distant future by the United States Army Chemical Corps in Edgewood, Maryland. A group of Army chemists, headed by director of research Dr. William H. Summermon, will deliberately expose themselves to nerve gas—the deadliest known chemical warfare weapon—which paralyzes the nervous system.

Nerve gas was invented and manufactured in large quantities by the Germans during World War II, though never used, and now it is being stockpiled by both the United States and Russia. It might well be the weapon of choice of an enemy planning to occupy a city. Odorless and invisible, the vapor from three drops can kill in four minutes. Under optimum conditions, with a brisk wind blowing at ground level, guided missiles containing the gas could probably destroy 90 per cent of all life within an area of many square miles.

The Army chemists, right after taking the poison, will inject themselves with one of a number of new compounds, the products of more than six years' research by the Chemical Corps and by various civilian scientific groups. If their calculations have been correct, they will suffer no ill effects. They will have moved a step toward eliminating the terrible menace of nerve gas.

The prospects of success are bright. Two of the compounds have protected laboratory animals against two types of nerve gas. The first compound was developed at New York's Columbia University the second was developed at Edgewood.

Photographs by Gus Pescatore

The Chemical Corps promised its cooperation, but the actual masterminding of Operation Eel fell to Christopher W. Coates, then as now curator of the New York Aquarium, and a world-renowned authority on the behavior of electric eels.

Coates' main supplier of exotic fish was Paramount Aquarium, Inc., of Dobbs Ferry, New York. The firm, originally German, was the largest in the business, with collectors and collecting stations scattered all over the world, but the war had brought its operations to a standstill. Moreover, though its personnel were anti-Nazi and had fled Germany at the beginning of Hitler's rise, they were still under surveillance as aliens. Nineteen of them had been interned in various Allied countries.

Coates undertook the delicate task of first getting them clearance for a semidomestic mission; then negotiating a deal whereby Paramount agreed to procure the eels if permitted to import other fish for its own account.

Of the free-lance collectors frequently retained by Paramount none knew the upper reaches of the Amazon better or had greater skill at trapping electric eels than a wiry, dandified, middle-aged Frenchman named J. Auguste Rabaut. The native fisherman of the Amazon will not go near electric eels, which as many can kill a man. Rabaut was then in New York on a visiter's visa and his status precluded Coates with another knotty person. On the one hand, Rabaut had had some slight difficulties with the Brazilian Government and, on the other, even if he went to Brazil, he would not hedge from the United States without a re-entry permit. To make things more difficult, the real reason for the expedition could not be disclosed to Paramount, to Rabaut or to any of the intermediaries. Coates himself was not supposed to know of the nerve-gas project— the word (Continued on Page 75)
The Terrible Threat of Nerve Gas

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never passed between him and Nachmannson—though he later guessed it.
The next hurdle was transport. As his base camp, Rabaut chose Letitia, a native village in the width of Colonia. The tent was supplied by a Germanian plane along the Amazon from Belém. But the flight was very perilous, as it meant an ascent into the vast, cloudy uplands of Brazil. No such plane could be saved statewide. But Coates heard that the United States Rubber Development Commission, a Government agency, had a PBY in Belém. After weeks of dickering, an Army plane flew Rabaut to Belém, and the PBY flew him thence up the Amazon.

The PBY returned to Belém after disposing Rabaut with a supply of food. He built a raft and began cruising the river, eyes peeled for electric eels. Most of the time they lie torpidly in shallow water. Rabaut would dip them alive with scissors, wait for them to die, and then stuff them into rubber gloves, toss them into a tin of water.

The eel collector lived in isolation, neglecting his food rations with which he could catch. His only means of communication with the outside world was through an occasional native boatman who ventured downstream. In this way Rabaut sent word to Coates via Belém that he desperately needed new rubber gloves. Coates enclosed several pairs in airmail letters to Belém. Almost all were received without comment by the United States military censor, but toward the end a few slipped through.

When the PBY returned for Rabaut, he had collected more than 100 eels. But before the plane could take off again, the Navy Department, moving in its own mysterious way, decreed that the plane should not transport either Rabaut or the eels across Brazilian territory. The alternative route was north through a series of rivers with 8000 feet high. The eels, together with their tanks weighted almost two tons. They had to be stored in the bow of the PBY; then, as soon as the plane cleared the river, shifted to the tail. The eels traveled the last leg of the journey—by rail from Miami to New York. Style. Freight cars were turned to them for so they rode in heated private compartments.

Behind Operation Ed and its contribution to a nerve gas antidote has been one of the most far-reaching quests in scientific fields. The life-saving drugs are only by-products of battle research into the human nervous system. The large goal is nothing less than the discovery of the nature of "Nerve's gift to the biochemist," Nachmannson famously calls the valuable contrivances, which have since become the constant in his writings. "The point is, man doesn't need much electricity to communicate an impulse, or a thought. But to electrocute, which is the way these rats and electric attack or defend themselves, obviously requires high voltage. Thus, they offer an enlarged reproduction of the human nervous system, where electrochemical phenomena are greatly amplified and so easier to study." On display in his Paris World's Fair of 1937 were two specimens of the Torpedo Naucrates, an electric ray from the Mediterranean, their flat, urn-shaped, bodies measuring ten inches in diameter. When the fair ended, Nachmannson persuaded the exhibitor to part with them. Displaying the baby monsters in a tank in his laboratory and insulating himself with rubber gloves, he sliced off bits of their natural batteries. As he expected, dihydroyestosterone-acetylcholine activity was rife.

A family holiday That Doesn't Leave You Broke

The Little-Known Genius Behind Supersonic Flight

We Spent Our Vacation Down on the Farm

A Family Holiday

Can He Bail Out Britain?

Prime Minister Harold Macmillan
Jeanne Crain's TOOTHBRUSH

Why is it so carefully guarded?

cause Jeanne Crain insists on a silirsh brush that's safe. She chooses a kind that gauzes itself against you. You can insist on a safe silirsh brush, and get a new Dr. Ferguson's... the only silirsh brush that inhibits or de-eyes germs that lodge in it and if it (whether they are picked while brushing or while the teeth hang in your bathroom)! It is the safest toothbrush ever made!

THE NEW A T R N E S W E L T E N G I N E R

THE JOKER IS WILD

A hairbrush that's also a toothbrush!

No, you may not borrow my knife!

A hairbrush that's also a toothbrush!

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The situation which now plagues the economic psychologist, as it troubles many others, is simply this: Can it last? Is it possibly its own gravestone? Must a decade of growth, of almost limitless witholding, and inestimably in satisfactions and relations?

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