

MEDICINE

Blood Wards Off Disease

Blood's gamma globulin protects children from diseases such as jaundice, mumps, measles and other serious infections that strike the young.

By JANE STAFFORD

► MEASLES, mumps, scarlet fever, jaundice. When you were a youngster you probably had all of those ailments, with whooping cough, chickenpox and German measles thrown in for good measure. Chances are you were pretty sick with most of them, too. Many of those diseases kept you in bed for days and days. You felt burning up with fever, your back and legs ached, your throat was sore. Then, when you began to feel a little better, the pain of an earache woke you in the middle of the night and wouldn't let you sleep again.

Today's youngsters are luckier. They can escape whooping cough entirely, by protective "shots" given them when they are babies. If jaundice breaks out at school or camp, all but the first young victims can be given shots to protect against that, too. And if they do get some of the diseases you had as a child, they will not be so sick.

Big Measles Year

Take measles, for example. This has been a big measles year. More than 500,000 cases have been reported since the season started. But many of these children got off lightly. They were sick a day or two, instead of a week or more. They had only a slight rash, very little fever. Not one in 100,000 died. More important, they escaped the serious complications that used often to follow measles in the past, such as pneumonia, ear infections that sometimes led to permanent deafness, kidney and heart damage that crippled the victim for life.

What made the difference? Some of it was due to sulfa drugs and penicillin that could be used to stop quickly the complicating infections that made measles so dangerous. A big part of the difference was due to a new kind of protective "shot" doctors now give to children four or five days after exposure to a case of measles at school or at home.

The anti-measles "shot" is a substance called a gamma globulin. It came from blood, the good red blood you gave to the Red Cross during the war to help

save our wounded men overseas. American civilians were generous with their blood during the war. They gave over 13,000,000 pints of it. The wounded got all they needed. And there was even some left over after the war. The surplus was in the form of plasma, the fluid part of the blood from which the solids had been removed.

This plasma part of the blood contains, among other valuable substances, the antibodies formed in the body to fight off invading disease germs. Since at least 85 out of every 100 Americans have had measles by the age of 20 the blood collected during the war had plenty of measles-fighting antibodies in it. Measles antibodies not only help fight off the measles germs during an attack, they also make the body immune to further attack by measles. That is why you do not get more than one attack of measles.

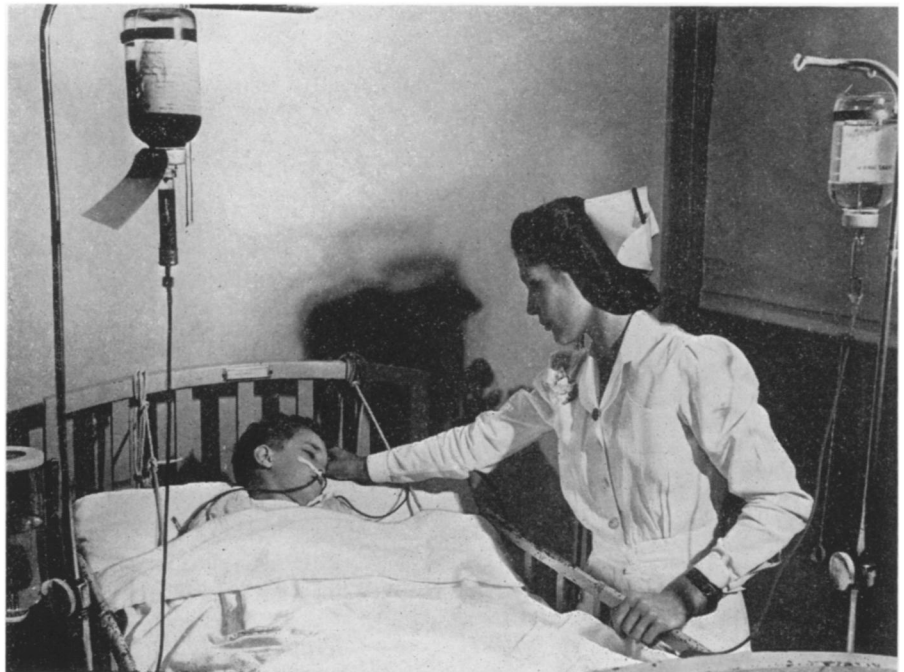
During the early part of the war, in fact by 1942, Dr. Edwin J. Cohn and associates at Harvard Medical School had

found a way of getting the globulin that contained the measles antibodies out of blood plasma in a concentrated form.

It was a by-product of the process by which serum albumin was separated from the plasma. This serum albumin was used, as soon as it was available, instead of plasma for transfusion to wounded and shocked men. It was just as effective as plasma and saved much space in shipping. At first the gamma globulin for fighting off measles was also reserved for the armed forces. The Army and Navy, recalling World War I experience, had expected measles epidemics in the training camps among young recruits from rural areas. If any such had developed, gamma globulin could have been used to check the epidemics and protect other young recruits who had not had measles.

Gamma Globulin

By 1944, however, there was enough gamma globulin on hand for the Red Cross to start distributing it through health departments to doctors, clinics and hospitals. It went back, free of charge, to the people who had given the raw material, blood, from which it was made.



SPEEDING RECOVERY—After a serious operation, blood from a Red Cross center is helping this child pull through.



PROTECTIVE SHOTS FROM BLOOD—Immune serum globulin is injected into a youngster in the children's ward of a hospital where an epidemic of measles threatens. In most cases, this will induce only a light attack and help give immunity.

Since 1944, more than 700,000 doses have been furnished by the Red Cross to help fight this childhood plague.

Most children are given what doctors call a "modifying" dose. The object is to let the healthy youngsters get a light attack of measles, but not escape it altogether. In this way they get a chance to build up in their own blood the antibodies that will protect them against measles throughout the rest of their lives. The antibodies in the gamma globulin from another person's blood protect only for about three weeks, instead of for life.

Anti-Measles Dose

Sick children and sick grown-ups who have never had measles, however, get a bigger dose of gamma globulin if they are exposed to measles. They get one big enough to ward off an attack completely.

But measles was probably not the only "catching" disease you had as a child. Like most other grown-ups, you probably had quite a few of the others. And, as in the case of measles, your body built up antibodies to the germs of these other diseases, too. The antibodies are found in the same gamma globulin part of the blood plasma. So it may be possible to protect children against other diseases besides measles by doses of gamma globulin.

Jaundice from the disease doctors call

infectious hepatitis is one example. This proved to be a serious problem during the war. Actually, scientists have since found that they were dealing with two kinds of liver inflammation, or hepatitis, both causing the yellowed skin condition known as jaundice. One kind comes in epidemics, and apparently is spread through contaminated water. Against this kind, gamma globulin gives protection. When the disease broke out in one institution for children, only two out of 100 got jaundice after they had been given gamma globulin, whereas 23 out of 100 got jaundice in the group not given the globulin. Unfortunately, gamma globulin does not protect against the other kind of hepatitis and jaundice.

Antibodies to infantile paralysis, to the streptococcus that causes scarlet fever and other serious diseases, and to mumps are also found in gamma globulin of blood.

Blood's gamma globulin may even in the future be able to save babies from coming into the world blinded from cataracts, deaf, with damaged hearts and feeble minds. Many such congenital defects, doctors now know, are due to the baby's mother having been attacked by German measles during the early months of pregnancy. Some medical authorities have suggested that abortions be performed on expectant mothers, if they get

German measles, to prevent the birth of defective children. But other scientists are hoping they can use a gamma globulin to ward off the disease in the mother, and thus prevent damage to her unborn child.

For this and other possible healing uses of blood, much more research is needed. And to do the research, scientists must have a supply of blood. At present, there is only enough gamma globulin on hand to take care of measles for another year.

We have the blood. It is circulating in the bodies of living, healthy American men and women. We gave over 13,000,000 pints of it during the war. Now we are asked to give some of our blood in the peacetime fight against disease and accidental death. Many are already giving to local blood banks. But these banks alone cannot supply the 3,000,000 to 4,000,000 pints medical authorities estimate are needed each year.

Nation-Wide Need

The blood need is nation-wide. The job of getting it must be done on a nation-wide basis, medical and health authorities decided. So they asked the Red Cross to take over. That agency has now set up a National Blood Program. Regional blood centers are being set up as rapidly as possible all over the country. Bloodmobiles will operate out of these centers, going into the small towns and country villages to collect blood, and

Handicraft Instruction Book

Full step by step instructions on all crafts including: Batik, Basketry, Beadwork, Block Printing, Cane Seating, Carving, Clay Craft, Coping Saw Work, Coin



Craft, Etching, Fabric Decoration, Felt Projects, Hammock Making, Jewelry, Knotting and Braiding, Leathercraft, Metalcraft, Ruffiawork, Rush Seating, Stenciling, Stuffed Dolls, Toy Making, Weaving, \$1.50 per copy postpaid, 72 pp. At local dealer or write

Educational Materials
46 East 11th St., New York

Do You Know?

Tobacco requires more care in harvesting than almost any other field crop.

Wheat straw, millions of tons of which are wasted each year, is now increasingly used for blending with wood pulp to make paper and also to make building-board.

During the summer of 1947 nearly 50 different kinds of *prehistoric animals* were discovered in scientific diggings in New Mexico; they range from an extinct species of snails to the ancestral diminutive four-toed horse called *Eohippus*.

A new *wire* for wiring buildings is about two-thirds the size of the ordinary kind used but is coated with natural rubber over which is a synthetic rubber and then a hard shell of nylon; it resists gasoline, oil, fire, moisture, acids and light.

Five-sixths of *Maine*, over 16,000,000 acres, is wooded.

Aluminum can be used safely in the presence of sulfur because unattacked by it.

When two plants of different lines are crossed with one another, the resulting *hybrid* is often more vigorous than either parent.

returning it after processing to the doctors and hospitals of the region.

At the regional centers, the blood will be typed, tested and treated with preservative. After 21 days, when it can no longer be used as whole blood for transfusions, it will be separated into plasma and red cells. Some of these materials will be kept in the centers for distribution as needed. Some will be sent to pharmaceutical houses for processing into serum albumin, gamma globulin, for measles, thrombin and fibrin foam for surgeons to use in stopping bleeding, and anti-hemophilic globulin. Some will be sent to medical research centers, for investigation of possible further healing uses.

All the blood and all the products made from it will be supplied free to hospitals and physicians for the people who need it.

The Red Cross will pay the expenses of collecting, processing and distributing. The cost to patient or family will be for the physician's or hospital's services in making the transfusion or the injection of gamma globulin or administering one of the other products.

Science News Letter, July 17, 1948

ORDNANCE

"Alloy X" for Gun Bores

► "ALLOY X," a war-born metal for lining gun bores to prolong their firing life, has properties "so remarkable as to justify concealing even the basic metal from which it was evolved," it is disclosed in a new book, *Rockets, Guns and Targets* (Little, Brown and Company), edited by John Burchard of the Massachusetts Institute of Technology. The book as a whole is an account of the strides made in many fields of ordnance research by workers of the Office of Scientific Research and Development during the war.

Although the account does not state what Alloy X is, it seems safe to infer that it is not a new kind of steel, for it was one of the materials tested for barrel liners when it was found that no improvement in steel itself could prevent rapid erosion and hence loss of accuracy and velocity under the high powder-pressures used in modern military firearms and the even higher ones anticipated for the future. Steel gun linings are weakened and destroyed in three ways during firing: through the melting of a surface film by the intense heat of the burning powder, through its chemical action under the heat and high pressure, and through the friction of the projectile as it passes through the bore. Erosion results are serious: the exceedingly costly 16-inch naval gun becomes

useless after about 200 rounds and has to be relined; near the other end of the size scale, the .50-caliber machine-gun barrel sometimes loses so much in accuracy after a few minutes of aerial combat that the plane is as good as unarmed.

Two methods of protecting gun-barrel steel are disclosed in the new book. One is the insertion of erosion-resistant liners, either for the full length of the barrel or at least near the powder-chamber, where erosion is worst. Stellite, a cobalt-chromium-tungsten alloy, has proved especially valuable for this purpose. The other method is a chromium plating on the whole surface of the bore. This plating is sometimes made a little thicker towards the muzzle. This imparted a slight choke, thereby giving the bullet some extra foot-seconds of muzzle velocity.

Other topics discussed at length in the book are the development of the many types of rockets used in the war, the recoilless 4.2-inch chemical mortar that was really a low-angle cannon, and the frangible bullet that made combat target practice more realistic yet perfectly safe.

Resistance to innovations by civilian "interlopers," and toe-dragging tactics by some of the "heavy brass" of the old-line Services comes in for some salty discussion in a chapter headed "Sand in the Gears."

Science News Letter, July 17, 1948

ENTOMOLOGY

Fight Snail with Beetles

► A BIG BLACK BEETLE with long legs and an insatiable carnivorous appetite may possibly become man's next ally in his unending fight against the pests that devour his crops and garden plants. Dr. F. H. Williams of the Pacific Science Board of the National Research Council transported a small collection of the insects from Africa to Hawaii where they will be put through critical tests in a triply screened laboratory, to see if they are adapted to Pacific island life.

If they pass the tests, and are approved for introduction by the administrative authorities, they will be sent on to Guam, Saipan and other islands in the Trust Territory under American Administration, and more will be brought from Africa to join them. The job for which they are being considered is attack on the six-inch-long giant African snail, which is chewing to shreds the cultivated plants and much of the wild vegetation of the islands.

This huge snail, *Achatina fulica* by name, was introduced into the islands during the period of Japanese occupation, as a food animal. Because the Japs liked it, the big mollusk was kept down to reasonable numbers. But the Japs are gone now, and

neither the natives nor the Americans care to eat it. With nothing to hold it in check, the snail is flourishing—at the expense of anything green that gets in its path.

To find something that would be willing to eat it, Dr. Williams went to its native home in Kenya, East Africa. There he found this black beetle, whose name is *Tefflus*, attacking the much bigger snail as a leopard might attack a cow. Since *Tefflus* is one of the most promising predators thus far found, a test lot was collected and prepared for the long journey to the Central Pacific via the United States.

Dr. Williams also carried with him a couple of hundred scold wasps, which have already passed their entrance exams as attackers against a beetle enemy of the coconut trees on the Palau islands. They destroy the undesirable beetles by laying their eggs on their larvae or grubs after stinging them into paralysis; the wasp larvae kill the infant beetles by feeding on their tissues.

Funds for Dr. Williams' work were supplied by the Office of Naval Research, and the entire project has been carried out at the request of the Navy.

Science News Letter, July 17, 1948