consistent with current discharge plans, for ordering those who remain in uniform, as soon as militarily possible, to duty at institutions here and overseas where they can continue their scientific education. Moreover, the Services should see that those who study overseas have the benefit of the latest scientific information resulting from research during the war.

Lid Must Be Lifted

While most of the war research has involved the application of existing scientific knowledge to the problems of war, rather than basic research, there has been accumulated a vast amount of information relating to the application of science to particular problems. Much of this can be used by industry. It is also needed for teaching in the colleges and universities here and in the Armed Forces Institutes overseas. Some of this information must remain secret, but most of it should be made public as soon as there is ground for belief that the enemy will not be able to turn it against us in this war. To select that portion which should be made public, to coordinate its release, and definitely to encourage its publication, a Board composed of Army, Navy, and civilian scientific members should be promptly established.

Program for Action

The Government should accept new responsibilities for promoting the flow of new scientific knowledge and the development of scientific talent in our youth. These responsibilities are the proper concern of the Government, for they vitally affect our health, our jobs, and our national security. It is in keeping also with basic United States policy that the Government should foster the opening of new frontiers and this is the modern way to do it. For many years the Government has wisely supported research in the agricultural colleges and the benefits have been great. The time has come when such support should be extended to other fields.

The effective discharge of these new responsibilities will require the full attention of some over-all agency devoted to that purpose. There is not now in the permanent Governmental structure receiving its funds from Congress an agency adapted to supplementing the support of basic research in the colleges, universities, and research institutes, both in medicine and the natural sciences, adapted to supporting research on new weapons for both Services, or adapted to administering a program of science scholarships and fellowships.

Therefore I recommend that a new agency for these purposes be established. Such an agency should be composed of persons of broad interest and experience, having an understanding of the peculiarities of scientific research and scientific education. It should have stability of funds so that long-range programs may be undertaken. It should recognize that freedom of inquiry must be preserved and should leave internal control of policy, personnel, and the method and scope of research to the institutions in which it is carried on. It should be fully responsible to the President and through him to the Congress for its program.

Early action on these recommendations is imperative if this nation is to meet the challenge of science in the crucial years ahead. On the wisdom with which we bring science to bear in the war against disease, in the creation of new industries, and in the strengthening of our Armed Forces depends in large measure our future as a nation.

Science News Letter, July 28, 1945

ORDNANCE

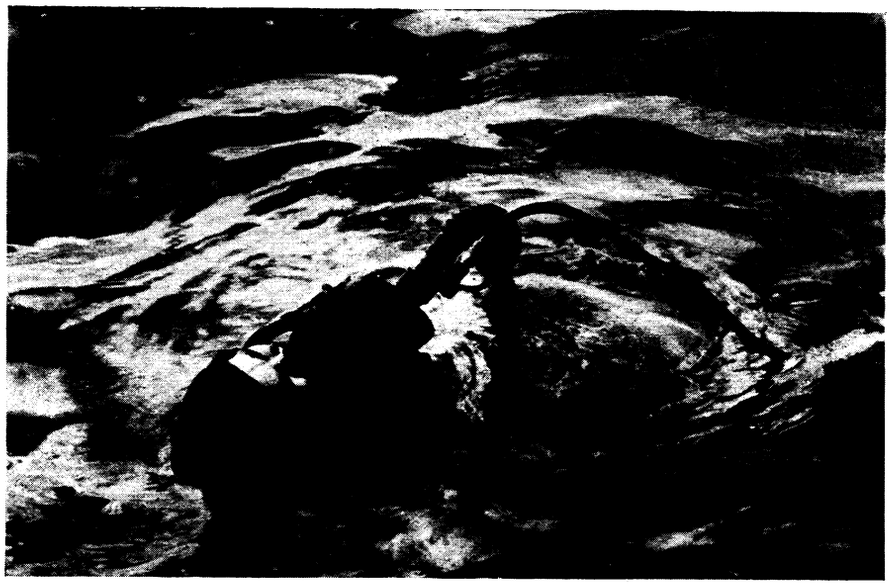
Kickless Cannon

Secret of the recoilless operation lies in construction of breech and of cartridge case. It is very accurate and so light that it can be carried by hand.

See Front Cover

➤ A ONE-MAN cannon, which fires without recoil, and enables the front-line infantryman to hurl regular artillery-type shells at enemy tanks and pill-boxes with the accuracy of a sniper's rifle, is the newest weapon to be put into the hands of American fighters, the War Department has disclosed. It has already been combat-tested, with highly satisfactory results.

Secret of the recoilless operation lies in the construction of the breech, and of the cartridge case that fits into it. The breech, instead of being tightly closed to prevent the backward leakage of gases when the gun is fired, is purposely left partly open, with a series of tubes to guide the back-flash when it comes. The wall of the cartridge case is perforated, permitting part of the gases to flow outward and then back. The force of this purposely arranged back-flash is just suf-



LIFE MASK—This air soldier, just surfacing out of the depths of a Marianas' lagoon, demonstrates how crew members in ditched B-29's use their high altitude oxygen masks and "bail out" bottles to fight free of their submerged ship and get to surface. Air Technical Service Command photograph.

ficient to offset the gun's recoil, so that the gunner actually feels less "kick" on firing than he would from a .22 rifle.

As thus far disclosed, recoilless cannon are produced in two calibers. One, which may be fired bazooka-fashion over a single man's shoulder, has a caliber of 57 millimeters (2¼ inches) and throws a 2¼-pound projectile to a range of two miles, with muzzle velocity of 1,200 feet a second. The other, which can be set up on the ordinary .30-caliber machine-gun tripod, has a caliber of 75 millimeters (3 inches); it uses three types of projectiles varying in weight from 13 to 15 pounds. Its useful range runs up to four miles, with a 1,000-foot-per-second muzzle velocity.

Muzzle velocities are low and useful ranges are relatively short, in both these weapons. However, it is not anticipated that they will be employed up to the limits of even the range they have; they are intended primarily for infighting at a few hundred yards, where the remaining velocities of their shells will be more than sufficient for their purposes.

By achieving completely recoilless operation, these weapons have made it possible to carry artillery fire-power and accuracy right up into the line with riflemen and machine-gunners. Hitherto, some measure of this has been made possible through the use of mortars and rocket weapons; but both of these suffer from the dual handicaps of relative inaccuracy as compared with rifled weapons, and very low velocity with consequent poor penetration when used against armor.

The new recoilless cannon are so accurate that it has been considered worth while to equip them with telescopic sights. Their gunners can pick their targets, such as the gun ports of concrete pillboxes or the turrets of tanks, with complete confidence of hitting them.

The guns are very light, largely because it has been possible to dispense with the recoil-absorbing springs and hydro-pneumatic cylinders that add so much weight to conventional-type artillery pieces. The 57-millimeter weapon (tube alone) weighs only about 40 pounds, so that one man can carry it on his shoulder. The 75-millimeter gun weighs 105 pounds; it can be carried over rough ground for at least short distances by from two to four men.

Every advantage, here as elsewhere, has its price. The purposely-arranged back-flash that offsets the recoil creates an area immediately to the rear of the breech where it is exceedingly unsafe to be when the gun is fired. Gun crews, as in the case of the bazooka and other rocket-firing weapons that also spit backwards when they go off, must be trained to work from alongside instead of from the rear as ordinary artillerymen do. Aside from this point to be remembered, there's nothing the matter with the new recoilless guns.

Science News Letter, July 28, 1945

PUBLIC HEALTH

Children Live Longer

Actual decrease in infant mortality is reported from Russia. Achievement is attributed to special pre-natal care and provisions for premature babies.

By N. EGOROV
Soviet Scientists Antifascist Committee

➤ CHILDREN of the USSR escaped during World War II the terrible consequences to life and health entailed by World War I. Owing to the endeavors of the government authorities, child mortality has actually decreased since the war broke out, and the figure now is less than two-thirds of what it was in 1940. The credit goes largely to the extensive work done in the prophylactic field, and it may here be said that prevention rather than cure is the keynote of the whole Soviet public health system.

In the care of mother and child, this feature is particularly pronounced. The fight against child mortality begins in the pre-natal stage. The health of the expectant mother and her child is the constant care of special welfare centers. Here all expectant mothers secure advice and, if necessary, treatment free of charge; throughout the period of pregnancy they are under medical observation, and if any deviation from the normal is noted, the woman is placed in a special clinic.

The mothers-to-be are also instructed at these centers in pregnancy hygiene, infant care and feeding and the symptoms of the principal baby ailments—an invaluable aid to the mother, particularly if the child is her first, in making herself and the home ready to receive the little newcomer to the family. To help the expectant mother with the various problems that arise, a midwife visits her at home, sees how she lives, and dispenses advice accordingly. For the confinement itself, there are in all the towns and district centers, special maternity homes or lying-in departments of the general hospitals.

In recent years, particular interest has developed in babies born prematurely. The records of the large obstetric clinics and the leading maternity homes reveal that a high percentage of survivals can be achieved. In the past few years hospital divisions for prematurely born babies have been opened in many of the Soviet towns and here the child spends, together with its mother, the first six or eight weeks of its life. The baby in this time progresses considerably towards normality, while the mother learns the special care it needs.

Nurses and doctors from the child welfare centers visit the homes of the babies under their supervision to see that they receive proper care and can develop normally. If the mother is ill and cannot nurse the child herself, or if her supply of milk is insufficient, the welfare center again comes to the rescue, for it has a donor station at which mothers with abundant milk can leave their surplus.

Then there are the nurseries and children's homes, where children are brought up under the supervision of competent medical and training personnel. The nurseries are for youngsters whose mothers work, while the children's homes take in children who have lost their parents or whose mothers are ill or alone. Between the ages of three and seven, children whose mothers go to work attend kindergartens. At seven the child goes to school, and here too it is under constant medical observation. The school doctors take measures for the prevention of contagious disease among the children in their charge, and physical training is also conducted under their supervision.

Science News Letter, July 28, 1945

Up to the time the yolk sac is absorbed and feeding begins fish are known as *fry*.

A new *liquid insecticide*, claimed to be effective in destroying chewing insects, is a sodium-antimony-lacto-phenate and will be known as SALP; although poisonous and toxic, it is relatively safe and economical.