

## FIGHTING INSECT PLAGUES FROM THE AIR.

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The expression "air ambulance service," which might with advantage be replaced by the term "aerial relief," embodies every aspect of the humanitarian tasks which can be carried out by aircraft. Among them is the campaign against insect pests—a little known but extremely useful activity.

Even before the war, the possibility of utilising aeroplanes for the dissemination of insecticides in the form of powder or gas had been envisaged. The idea was taken up again a few years later, and the first successful experiments were carried out in 1921, in the United States, where lead arsenite was scattered on orchards infested with insects. The same methods were subsequently adopted for the protection of the cotton plantations.

In 1925, following the damage done to pine forests by insect plagues, the question was brought up in Germany. The problem was a knotty one—patient research and experiment were necessary in order to discover a chemical product which would destroy the insects and yet be harmless to human beings, game and vegetation. Research was guided by experiments made in gardens with the liquids used for the protection of trees and flowers. A chemical solution was evolved, composed of calcium, copper, lead and arsenic, utilised in the form of a powder. Up to the present it has been used only in this form, but there is nothing to prevent it being used as a liquid or gas.

The construction of an apparatus for sprinkling the powder also presented a certain number of difficulties. The first satisfactory results were achieved by the German air lines in collaboration with the Junker works. At the beginning, the plan envisaged was the conversion of a transport plane, the F.13, into a sprinkling machine. It was found, however, that instead of spreading out evenly the powder remained in a compact mass, and a vibrator was accordingly attached to the orifice through which the powder was ejected. Following this relatively unsuccessful experiment, the Junker works built a special aeroplane, the W.33, fitted with an improved sprinkler and so equipped that the sacks of powder could be carried in the distributing apparatus placed under the machine. This apparatus and the sprinkler are worked by means of a small propeller fitted to the side of the aeroplane; the position of the propeller and the consequent velocity of the apparatus can be regulated from the interior of the machine. Large quantities of powder can be disseminated from both sides. The operation is carried out as follows: The aeroplane flies over the contaminated area at a height of 25 to 60 yards above the tree tops; the powder when dropped forms narrow bands and the ground must be gone over again and again until the whole area is covered. The insects which attack pine forests are very numerous, and as many as 6,000 may be found on a single tree.

But forests are not the only things which can be protected in this way. Tropical countries swarm with harmful insects. The "locusts of Egypt," which have been the plague of that country from time immemorial, have lost none of their unenviable reputation with the passage of the centuries. A couple of years after the War, a large tract of Southern Russia was devastated by these destructive insects, despite the efforts of hundreds of thousands of men and whole regiments to limit their depredations. Attempts were made to destroy them by the usual methods of insect powder and corrosive acids, but with little success. As a result of these disheartening experiences, the Aerial Transport Company of Dobroljot worked out a plan, in conjunction with the Ossoaviachim Army Chemical Institute, for attacking the plague from the air on the same lines

as those adopted for the protection of forests. The large credits placed by the Government at the disposal of the air forces in Russia have made it possible to develop this activity on a large scale.

The colossal ravages caused by locusts in Egypt have led to the creation of an international organisation for combating this pest, to which Turkey, Palestine and Syria have adhered.

Aircraft has also been instrumental in reducing the peril of malaria-carrying mosquitoes. War has been waged against the anopheles mosquito for many years past by various methods, but nothing has proved so effective as the aeroplane for bringing about the total destruction of the insect's eggs.

Besides the services already rendered by aircraft in combating insect plagues, there are many others of a similar kind which could be entrusted to it in the future, e.g., the annihilation of insects and microbes which prey on cereals, and the destruction of weeds. Judicious collaboration between science and aviation offers a host of possibilities of useful service to humanity.

*(Communicated by the Secretariat of the League of Red Cross Societies.)*

## EDUCATION OF THE BLIND.

### JOINT COMMITTEE'S REPORT.

After five years of work, during which the whole field of the education of the blind in Great Britain has been investigated, the Joint Committee of the National Institute for the Blind and the College of Teachers of the Blind has issued its Report. This is published by Messrs. Arnold (7s. 6d.) under the title "The Education of the Blind." The Report discusses the emotional, moral and physical training from babyhood until the threshold of adult life is reached at 16.

"It is not easy to determine whether the gamut of emotions is wider or narrower for seeing than for blind children," the Report states, "but competent observers have suggested to us that, although blind people conform to no fixed emotional type, blindness does tend to exaggerate the effects of inborn emotional tendencies—to make the self-assured child more aggressive or vainglorious and the timid child more self-effacing."

Emphasis is laid not on the blind child's acquisition of scholastic facts, on wide knowledge, or on special skill in a selected vocation, but on that all-round harmonious development which will set him in tune with the world in which he has to live. Contact with flowers, plants and animal pets will help to give a true, even though unseen, background to life.

"The Committee hold it of the greatest importance that teachers of the blind and particularly those in residential institutions, should remember always that the deepest and most fundamental needs of blind children are a rich and intimate experience of common things and a direct acquaintance with the many characters that move across the scenes of daily life."

In contrasting the mental development of blind children with that of seeing children, the Report says: "There are undoubtedly certain diseases, to which particular cases of blindness can be traced, which very seriously damage the sources of mental and physical energy. But if we exclude these special cases there seems to be no reason why in the present state of our knowledge we should impute to the blind any inferiority of intelligence. Within the field in which his knowledge is direct or well founded a blind man's intelligence may be as great and may work as actively and surely as any others. What

[previous page](#)

[next page](#)