

## Study Why Flyers Fly

Doctors and psychologists of the U. S. Air Service are trying to discover what it is that makes fliers fly.

"Everyone that wants to fly can't learn," says Major Francis H. Poole, chief of the School of Aviation Medicine now located at Brooks Field, San Antonio, Texas. "Many a man apparently physically and mentally fit and ambitious to become an aviator can never safely leave the ground. Inherent flying ability is hidden below the surface, and the staff of experts here is trying to devise various means of detecting it."

The U. S. Army wants flying in the air to be as safe as walking on the ground, and the personality of the pilot is as important as the motion of the motor, Major Poole says.

A machine now being built at Washington, D. C., at the U. S. Bureau of Standards under the direction of Dr. L. J. O'Rourke, psychologist, director of Federal Personnel Research, will mechanically probe the mental make-up of prospective fliers and aid in the elimination of those whose reactions make them unfit for the air.

Major Poole points out that Dr. O'Rourke, at the request of the Air Service, has undertaken the work as part of the extensive program of co-operation of the Personnel Research Division of the United States Civil Service Commission in industrial and personnel research problems involving selection and training.

The speed with which the man examined reacts to signals in color, light and sound, the rapidity with which he makes decisions of what to do in emergencies, the degree of coordination of his movements and other mental characteristics, will be determined by the machine.

The machine is expected to be put to work around March 1, and Capt. Neely C. Mashburn, chief psychologist of the school at Brooks Field, says that some such apparatus has been sought for because it is necessary that the verdict on the ability of the prospective flier be uninfluenced by the whims and peculiarities of the examining officer.

Emotional stability, in the opinion of Captain Mashburn, is the most important single characteristic of a good flier. Signs of nervous unbalance often do not show on the surface and no known measuring apparatus or mental test has been able to delve into a man's inner na-

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## What we Know About Pneumonia

This is a summary of the present state of our medical knowledge about pneumonia.

When two out of five people die with lobar pneumonia in the sporadic outbreaks that occur every winter, the cry usually goes up that no progress is being made in the understanding or treatment of this highly fatal disease. In spite, however, of the very discomfoting death rate that still prevails, there have been marked advances during the last fifteen years in all aspects of the pneumonia problem.

### Types

In the first place it is no longer proper to speak of pneumonia in any but a very general sense. We should say instead, the pneumonias, for there are four distinct types. While the outer aspects of a case of any one variety compared to another would to the lay mind probably seem pretty much alike, to the modern physician the determination of the particular type in each case is nearly indispensable.

Types I and IV, for instance, are the milder types with death rates around 20 to 25 per cent. Types II and III are the severe types with death rates that range from 40 to 50 per cent. Happily, Types I and II constitute at least 70 per cent of all the pneumonia cases and the other two make up the remaining 30 per cent.

Mild Type I is the characteristic pneumonia of the young. It constitutes about half the lung pneumonias that attack young people up through the early years of adult life. Severe Type III usually attacks people past the prime of life, especially women. The high death rate of Type III is probably due to its predilection for the old and its tendency to run a longer course than the others.

Serious complications from other infections occur more frequently with Type I than with the others, but Type II is the one pneumonia of septicemia, and when septicemia sets in the end is almost always fatal. Types I and II are pneumonias that can be picked up first hand, but III and IV usually appear after the patient has contracted some other respiratory infection.

### Epidemiology

The Rockefeller Institute for Medical Research has found out much about how pneumonia spreads. The globular germs known as pneumo-

cocci that cause the first three types are rarely found in normal throats, but Type IV pneumococci occur in about half the throats of healthy individuals.

Nurses or anyone in close contact with a case of pneumonia are quite likely to pick up the germs and become carriers, and it is a fairly safe guess scientifically, that it is by such carriers that pneumonia spreads from person to person. Since Type IV is usually secondary and is so often on hand the chances are strong that with this variety the patient receives the infection from his own throat. In general it may be said that the pneumonias are acquired by contact just like a cold in the head.

To prevent the spread of pneumonia the patient should, of course, be isolated and everything about him scrupulously disinfected. It has been established that human carriers are an important factor in the spread of this disease, but at present there is no legal effort made to control them. Authorities say that such control may be a possible development of the future.

### Oxygen Treatment

Oxygen plays an important role in modern treatment of pneumonia. The inflammation in the lungs interferes with the normal supply of oxygen to the blood and the symptoms of oxygen hunger ensue that occur in healthy people when they reach high altitudes in mountain climbing. In a patient struggling with pneumonia such a condition is an undesirable complication that oxygen administration is designed to counteract. Apparatus has been devised by which regulated amounts of the essential gas are released in the patient's pharynx through a rubber mouthpiece that brings the oxygen concentration of the blood up to

### Cause of Death

A generation ago it was commonly thought that death in pneumonia was due to heart failure. While this may be true in a general sense, according to Dr. Russell L. Cecil, who has worked on pneumonia problems at the Bellevue Hospital for many years, it is little different from other infections which are subject to control as long as they are isolated, but become a serious menace when the bacteria break out into the general circulation. The virulent germs re-

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## Pneumonia

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lease toxins that act on medullary centers and so cause a heart reaction. From studies made at the Bellevue approximately 90 per cent of the fatal cases of pneumonia showed large numbers of pneumococci in the blood during the last day or two of life.

### Serums and Vaccines

Although pneumonia still takes an annual toll of human life almost as great as tuberculosis, so many advances have been made in the last few years in understanding how the human body actually stages its recovery from lobar pneumonia that medical authorities feel that the future outlook for the treatment of this disease is decidedly hopeful.

Medical experts now know that, at what is popularly known as the turning point in a case of pneumonia, a number of immune substances appear in the blood. It is equally well established that it is impossible for the toxin releasing pneumococci to stay in the blood after enough of immune bodies have made their appearance. It appears that they are able to do something to the pneumococci that makes them fall an easy

prey to the white corpuscles of the blood. They are readily disposed of by these leucocytes of the blood stream, once there is enough of the immunizing substance present.

The natural thing to do when these facts were established was for experts to work out a way of preparing this immune substance in the laboratory so it could be administered to the patient to help along and speed up the business of destroying the pneumococci in the blood. The process has been complicated by the fact that each of the four types of pneumonia produces its own type of immune bodies. In order to treat a case successfully the prepared serum must contain the special immune substance for that particular kind of pneumonia from which the patient was suffering. To meet this condition various sera have been put into practical use for pneumococcus pneumonia that all contain specific immune bodies that work against more than one type of the disease.

The big problem at present in the specific therapy of pneumonia is to get in an adequate amount of the immune substance without shocking the patient. As soon as the chemist has purified anti-pneumococcus serum to such a point, the specific treatment of pneumonia will be just as efficient as that for diphtheria or scarlet fever, though here, as in other infections, early treatment is essential.

During the World War the value of preventive vaccination was amply demonstrated. Thousands of soldiers were vaccinated with a triple pneumococcus vaccine with very satisfactory results. Dr. Cecil, quoted above, says that it is a comparatively simple matter to vaccinate monkeys against the different pneumonias and have them remain immune from six to eight months. He recommends vaccination as a practical prophylactic measure for soldiers in armies and for individuals who have had several attacks of pneumonia and live in fear of others. The results, he says, from vaccinating several such persons in his experience, have been very good for in each case there have been no recurrences. With a concentrated and purified solution of pneumococcus immune bodies it should eventually be possible to maintain the sterility of the patient's blood in all types of pneumococcus pneumonia, and thereby cause a marked reduction in the death rate of this dreaded disease.

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ture and prove whether or not he could stand up under an extreme strain. Even the trick horrors of initiation stunts do not go deep enough.

For this reason, aside from machine-made tests and medical examinations flying students have to undergo, each applicant is now subjected to a searching personality study. The past life of the applicant is as carefully gone over as his eyesight, hearing or heart action. The way in which he is found to have faced emergencies in his past life indicates how he will probably behave in the air in the future, Captain Mashburn believes.

The United States is making rapid advances in the psychological study of its future fliers, Major Poole said, and the very low mortality in the American flying services is due to this.

In the United States only about a dozen lives were lost during 1926, while in England in only eleven months of that year there were 81 deaths and 51 accidents. There were 230 crashes in the British service where the machines were wrecked beyond repair.

"It is my opinion," Major Poole said, "that 90 per cent of all accidents are due to the pilots and not to the construction of the plane. Machines today are almost fool-proof, and it is easier to get good mechanics than experts to pick out the men who will not kill themselves."

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An apple tree should have at least 30 to 50 leaves to each apple.

Virginia ranks next to California in the amount of annual sunshine received.

The cat flea and dog flea are distinctly different, though both infest cats and dogs.

Farmers sometimes dust grains of corn with powdered talc before planting them, to make the corn unattractive to crows.

Honesty in children is greater in proportion to their intelligence, according to an investigation with New York school children.

Choctaw and Hopi Indians have the reputation of being particularly musical, according to Frances Densmore, student of Indian music.

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