Mankind Will Some Day Be Proof Against Disease.

EVERYONE knows that when a man has once had yellow fever and recovered he never contracts the disease again, no matter how much he exposes himself to infection. This ability to resist the minute organisms which cause the malady is called immunity, and in tropical countries, where yellow jack is always present, it is turned to profit in various ways, says the Denver Post.

Thus during the Spanish-American war regiments of immunes were enlisted in the south for service in the fever-ridden country about Santiago. Again, during the last epidemic of yellow fever in New Orleans many persons purposely exposed themselves to infection because the disease prevailed in a very mild form, and they concluded that if they were infected they would quickly recover and would be immune during more severe epidemics in the future.

Such immunity is called natural immunity, because it is produced in the human body by the mysterious workings of nature. A good many diseases leave it in their trail, in a more or less marked form. Yellow fever, as we have seen, is one of them. Smallpox is another, and measles and scarlet fever are others.

To a less degree typhoid fever also makes convalescents immune to future attacks, though this immunity is variable and lasts for but a few years. Other diseases, on the contrary, leave no immunity whatever. One of this sort is influenza. A man might, conceivably, have influenza every winter for a dozen years. Again there are a few terrible maladies which produce a quite opposite effect. The most conspicuous of these is pneumonia, which leaves its victim not less but more liable to repeated attacks in future.

But all curable diseases, it is plain, leave a certain amount of immunity behind them at the moment they make their exit, even if like pneumonia they produce an effect in the long run of greater liability. A man, for example, contracts influenza and the germs invade his system. For a couple of days perhaps his blood battles with them in vain, but at the end of the week it begins to win. In 10 days the germs, or the poisons they secrete, are overcome and the man is well again.

At this moment it is obvious he is immune to influenza, because his blood has in it enough germ killing power to counteract the activity of the countless hordes of germs coursing through him. For the time being, in brief, he is proof against influenza. Six months or a year later the disease may lay him low again, but so long as his blood is keyed up to its work of germ killing and poison neutralizing he is, to all intents and purposes, an immune.

It early occurred to medical investigators that some means might be devised for producing immunity artificially. Two thousand years ago human experience had proved that a man who had once suffered from smallpox could not take the disease again and there were crude attempts at vaccination. In the eighteenth century Jenner, an Englishman, gave the subject long study, and the result was the process of vaccination as we know it today.

Briefly, this process consists in inoculating a man with a mild variety of smallpox in order that he may be immune thereafter to more virulent and deadly forms of the malady. This mild younger son of smallpox is called cowpox, and cattle suffering from it are maintained as unwilling manufacturers of the virus. It causes scabs to form upon the surface of their bodies and in these scabs are millions of cowpox germs. The virus is made by dissolving the scabs in some appropriate medium.

When you are vaccinated the doctor scratches your arm until the skin is broken and puts a few drops of virus into the little wound. You are thus inoculated with cowpox and in a few days the symptoms of the disease—which are the symptoms of smallpox in miniature—appear. You feel tired and perhaps nauseated and your arm swells and grows sore.

In a week or two you recover—and thereafter you are immune, not only to cowpox but also to smallpox. In some persons this immunity lasts for life, in others it lasts but a few years. Hence the medical rule that for safety's sake everyone should be vaccinated every two or three years.

To understand exactly how vaccines and antitoxine produce artificial immunity it is necessary to recall the fact that the germs of disease in their efforts to destroy the lives of human beings work in two ways. In some diseases the germs themselves do the evil work by clogging and breaking down the tissues. One such disease is tuberculosis and another is leprosy.

In other maladies the germs secrete violent poisons, which on being distributed through the body in the blood cripple and disable vital organs, much as strychnine, carbolic acid or snake poison cripple and disable them. Such a disease is diphtheria and another of the same class is lockjaw. Again, there are diseases which work in both ways. Diphtheria is one such and pneumonia is another.

Now the problem before the bacteriologist is to produce something to kill the germs in the first class of maladies and something to neutralize the poisons in the second. In the third class either method of procedure is allowable, though in practise the germs themselves are usually neglected and the greatest effort is put into the fight against their poisons.

In all of the processes so far devised the capacity of the blood and tissues for producing natural immunizing substances within themselves is called into play. In vaccination, for example, the blood is stimulated by the introduction of cowpox germs into producing substances capable of slaying the germs, not only of cowpax, but also of smallpox, and these substances, by the fact that they remain in the blood a long while after the last cowpox germ has been killed, produce immunity to smallpoz.

In a word, the presence of a germ always stimulates the blood to produce something to kill that germ. That something has been given different names by different investigators, but all now agree that it appears in the yellow serum in which the red and white corpuscles of the blood float about. When it is present the white corpuscles gobble the germs and kill them. When it is not present the germs put the white corpuscles to flight.

Now it happens that when the blood, by any cause or device, is stimulated into producing anti-germ substance enough to kill a small number of active germs or a large number of weak and disabled germs, it does not stop when its work is done, but keeps on manufacturing a large extra stock of anti-germ substance. This extra stock, remaining in the blood, causes the immunity which follows an attack of yellow fever. The problem before the bacteriologist is to make the blood produce a lot of this substance whenever he so wills it.

Ordinarily he does it by introducing into the blood a quantity of attenuated germs. In his laboratory he has a large stock of germs of all sorts at all times, and there are half a dozen ways whereby he may attenuate and stun them. One way is to expose them to the air.

Another way is to pass them through the tissues of some animal which has a natural antipathy to them, and in consequence is capable of weakening and paralyzing them. Still another way is by heating them until they are just short of dead. Yet another way is by paralyzing and half killing them with chemical antiseptics.

When the bacteriologist has stunned a mass of germs by one of these processes he injects a number of them into the veins of the man he desires to immunize. At once the blood of this man begins to secrete a substance capable of killing them. This substance is soon present in sufficient quantity to kill all of the weak germs the bacteriologist has introduced into his patient's veins, but the blood, spurred on by nature to make assurance doubly sure, keeps on producing the substance for some time after.

As a result the patient's veins become full of it, and if any more germs of that sort happen in they will be killed out of hand. In other words, he has been immunized. Sometimes this artificial immunity lasts a good while, at other times it is very short.

Ordinary vaccination presents the best example of such immunizing by the use of weak germs, but of late it has been found possible to take the same measures against typhoid fever and Asiatic cholera. During the Manchurian war the Japanese army surgeons immunized the Japanese troops against typhoid by inoculating them with small doses of weakened typhoid germs. The result was that there was little if any typhoid in the Japanese army, and thousands of lives were saved. The same thing has been done in the case of Asiatic cholera, with the same result.

VACCINATES TOO LATE.

But in the great majority of cases it is impossible to vaccinate in time. In other words, the patient goes to a doctor, not before he contracts a disease but afterward. The problem then is not to make him immune against it, but to combat and kill the germs already in his body or to counteract the poisons they secrete.

In this case it is necessary to let some other animal do the work of producing the anti-germ substance or the poison antidote. In diphtheria, for instance, the horse is used. A healthy animal is inoculated with the diphtheria microbe, and because the horse has a sort of natural antipathy to it it contracts the disease in a mild form. But all the same its blood produces an immense quantity of a substance which possesses the property of counteracting or neutralizing the effect of the toxin, or poison, secreted by the diphtheria germ.

When the veins of the horse are full of this substance some of the animal's blood is drawn off and injected into the veins of a human diphtheria patient. The antitoxin in the horse's blood does not lose its power by its voyage into human veins.

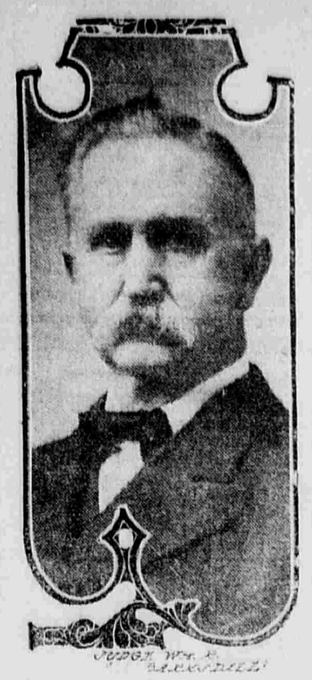
Instead it resumes at once its old business of counteracting the poison secreted by diphtheria germs. As a result the poison in the human patient's veins is rendered innocuous and the patient recovers. Such is the action of diphtheria antitoxin, which has reduced the death rate of diphtheria from 65 per cent to 2 per cent.

Again, it is possible to transfer from the veins of an animal to the veins of a human being blood which has acquired not the capacity for neutralizing germ poisons but the capacity for killing germs themselves. The process in general is exactly the same and the effects are the same. This scheme has been employed in combatting typhoid fever, cholera, the bubonic plague, pneumonia and boils.

There are also other methods of producing artificial immunity, but limited space requires that they be mentioned but briefly. One consists in accustoming the human body to germ poisons by injecting them in gradually increasing doses. Another, which has the same principle at bottom, consists in injecting dead germs in those tissues in which these same poisons lie. These processes have been employed against typhoid fever, the bubonic plague and anthrax, a disease of cattle.

It is highly probable that within a few years it will be possible to be vaccinated against a great many serious diseases, including tuberculosis. Koch's tuberculin, with which new experiments are now being made, consists of poisons dissolved out of the bodies of dead tubercle bacilli. When this tuberculin was first tried it was a failure, but it is now seen that this was due not to a defect in the remedy itself, but to improper methods of administering it.

It is also probable that much progress will be made in manufacturing antitoxins. Those for diphtheria and lockjaw are now in common use, and there is likelihood that others for blood poisoning, pneumonia and various lesser diseases, will soon be perfected. Even appendicitis may eventually yield to treatment without the knife, and those physicians who believe that cancer is caused by a small organism say that it, too, will be conquered.



JUDGE WM. R. BARKSDALE.

VIRGINIA'S QUICK ACTION JUDGE.

Judge William R. Barksdale, of Virginia, who is to sit at the trial for murder of Judge W. G. Loving, is one of the most active men in the Old Dominion. He is a very capable man, thoroughly versed in the law and highly respected by his fellow citizens. He is particularly noted for his snappy decisions and has rarely been reversed on appeals.

REMARKABLE RESCUE.

That truth is stranger than fiction, has once more been demonstrated in the little town of Fedora, Tenn., the residence of C. V. Pepper. He writes: "I was in bed, entirely disabled with hemorrhages of the lungs and throat. Doctors failed to help me, and all hope had fled when I began taking Dr. King's New Discovery. Then instant relief came. The coughing soon ceased; the bleeding diminished rapidly, and in three weeks I was able to go to work." Guaranteed for coughs and colds, 50c and $1.00, at Z. C. M. I. drug store. Trial bottle free.

Eagles' Day, June 19th, Salt Palace.

NEXT WEEK IN HISTORY.

JUNE 16.

1593—Christopher (Kit) Marlowe, English dramatic poet, killed at Deptford; born in Canterbury 1564.

1815—Napoleon defeated Blucher at Ligny, and the allies defeated Ney at Quatre Bras, both preparatory to Waterloo. The defeat of Blucher at Ligny led to the battle on the field of Waterloo.

1866—Prussia set her armies in motion, and the single campaign war with Austria began.

1900—Prince de Joinville, son of King Louis Philippe of France, who for a time served in the army of the Potomac on the staff of General McClellan, died in Paris; born 1818.

1904—The Russian General Stakelberg, at the head of 14,000 men, defeated in attempt to relieve Port Arthur by the Japanese forces under General Oku.

1906—Bill admitting Oklahoma to statehood became a law.

JUNE 17.

1696—John Sobieski (John III of Poland), Polish national hero, died.

1719—Joseph Addison, standard prose writer of England, died at Kensington; born 1672.

1775—Battle of Bunker Hill.

1854—Mme. Henriette Sontag (Countess de Rossi), German soprano singer, died in Mexico; born at Coblentz. Mme. Sontag was one of the most celebrated singers of Germany. She met with the highest success in America in a tour which began in 1853.

1897—The Rev. Father Kneipp, famous doctor-priest, died at Woerishofen, Munich; born 1822.

1900—Chinese forts at Taku, on being ordered to surrender to the allied navy, opened fire; the Russian, British, French, German and Japanese ships returned the fire. The forts surrendered, and wild riot in Pekin followed.

1905—General Maximo Gomez, the Cuban leader, died at Havana; born 1831.

JUNE 18.

1778—The British evacuated Philadelphia.

1812—Congress declared war against Great Britain.

1815—Battle of Waterloo.

1884—Bishop Matthew Simpson died in Philadelphia, born in Cadiz, O., 1811.

1894—William Hart, N. A., a well known painter, died at Mount Vernon, N. Y.; born 1822.

1900—Baron von Ketteler, German minister at Pekin, killed by a Chinaman wearing the national uniform.

1901—Louis Aldrich, popular American actor, died at Kennebunkport, Me.; born 1843. Hazen S. Pingree, ex-governor of Michigan, died in London; born 1841.

1906—Governor John M. Pattison of Ohio died at Milford, O.; born 1847.

JUNE 19.

1794—Richard Henry Lee, the first to introduce resolutions for independence, died; born 1732.

1864—Battle of the Kearsarge and Alabama off Cherbourg, France.

1867—Maxmilian, titular emperor of Mexico, was shot at Queretaro by the Republicans; born 1832. Maxmilian was a brother of Emperor Francis Joseph of Austria. He had been deceived as to the real situation in Mexico and on assuming the imperial dignity found bitter opposition at the hands of the liberals. He was taken prisoner after a sharp battle at Queretaro and executed in retaliation for his harsh decrees against Mexicans who resisted his authority.

1902—King Albert of Saxony died at Dresden; born 1828.

1905—The capital of the United States named as the meeting place of the Russian and Japanese peace plenipotentiaries.

JUNE 20.

1837—William IV, of England died; accession of his niece Victoria. William IV was the son of George III. He succeeded George IV in 1830. The king had lost two children in their infancy, and upon his death the crown passed to his neice, who enjoyed the remarkable reign of 64 years.

1867—The final papers were signed by which Alaska was sold to the United States for $7,200,000.

1876—Santa Anna, general, dictator and president of Mexico for many years, died at his estate of Mango Clavo; born 1795.

1900—Count Muravieff, noted Russian statesman, minister of foreign affairs, died at St. Petersburg; born 1845.

1903—Cardinal Vaughan, Roman Catholic primate of England, died in London; born 1832.

JUNE 21.

1631—Captain John Smith, famous in Virginia settlement, died in London; born 1579. Captain Smith's romantic adventures were not confined to the Pocahontas episode. In early life he won a patent of nobility in wars against the Truks, was captured in battle and sent as a slave to Constantinople, won the affection of his mistress, was maltreated by her brother, a pasha, whom Smith killed, then fled the country dressed in the dead man's clothes. On arriving in America Smith was excluded from the councils at Jamestown, but finally triumphed and became the real head of the Virginia colony. While out on a foraging excursion gathering Indian maize to keep the colonists from starving he was captured by the Indians and, as the story runs, his life was saved by Pocahontas. He sailed for England in 1609 and never returned to Jamestown.

1819—Jacques Offenback, noted musical composer, born in Cologne of German-Jewish parents; died 1880.

1900—A force of American marines under Major Waller ambushed in the road from Taku to Tientsin; the American consulate at Tietsin destroyed by Boxers.

1901—Hoshi Toru, noted Japanese statesman, formerly minister to Washington, assassinated at Tokio for political reasons

JUNE 22.

1527—Nicholas Machiavel (better known as Machiavelli), Italian statesman, who reduced intrigue to a science, died; born 1469. Machiavelli held the office of secretary to the ten who managed the diplomatic affairs of the republic of Florence. In that capacity he successfully carried out several missions to France. The Medicis banished him.

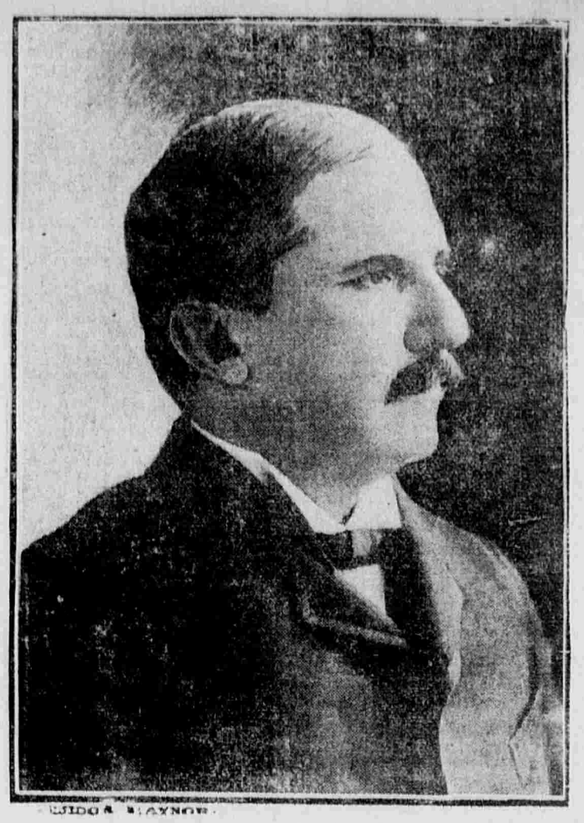
1806—Emile de Girardin, journalist, red republican and speculative writer, born in Paris; died 1881.

1884—At 9 p. m., Smith's sound, Captain Schley's command reached and rescued Lieutenant A. W. Greely and six others, only survivors of the Greely expedition to Lady Franklin bay.

1898—General Shafter's corps made the first landing on Cuban soil at Daiquiri.

1904—Ion Perdicaris, a Greek citizen of the United States, in captivity to Raisuli, the Morocco brigand, released.

1906—King Haakon VII of Norway crowned at Trondhjem.



SENATOR RAYNOR.

RAYNER SEES HOPE FOR DEMOCRACY.

Senator Isador Rayner of Maryland says that the country is at unrest under Republican rule, and that the president has gone too far in many of his actions as leader. The great opportunity of the Democratic party, he says, now confronts it and he sincerely believes that Republicanism will be overthrown at the next national election. He predicts tariff reform and territorial expansion as the issues of 1908.

HE FIRED THE STICK.

"I have fired the walking-stick I've carried over 40 years, on account of a sore that resisted every kind of treatment, until I tried Bucklen's Arnica Salve; that has healed the sore and made me a happy man," writes John Garrett, of North Mills, N. C. Guaranteed for Piles, Burns, etc., by Z. C. M. I. drug store, druggists. 25c.