SCIENCE NEWS

Science Service, Washington, D. C.

DR. LANDSTEINER'S DISCOVERY OF BLOOD GROUPS

DISCOVERY that human blood is of four different types, and that blood of one type does not always mix with blood of another type, has won the 1930 Nobel prize in medicine for Dr. Karl Landsteiner, of the Rockefeller Institute for Medical Research.

The enormous importance of Dr. Landsteiner's discovery has been evident to patients who have had the life-saving operation of blood transfusion performed. For this operation the blood of the donor and that of the patient must mix well, or serious and even fatal results may occur. Consequently before each transfusion, samples of the two bloods are tested or "matched" to see if they are compatible and belong in compatible blood groups.

When the blood liquid of one normal, healthy person and the red blood cells of another are put in the same test-tube, instead of mixing freely the red cells often clump together as if they were glued, Dr. Landsteiner observed during the course of some investigations made in Vienna in 1900. Scientists call this gluing together or clumping, agglutination. When it happens in a man's vein, following blood transfusion, death may result.

Agglutination does not take place at random, but depends on certain definite properties of the blood. It is on the basis of these properties that blood was divided into different groups or types. Three of the types were discovered by Dr. Landsteiner and the fourth by two of his students.

Every human being belongs to one or the other of the blood groups. To a certain extent blood groups are inherited, and this fact is often used to determine paternity. If the blood groups of each parent are known, one can state to which groups their child might belong.

BACTERIOPHAGE THERAPY

CARE in selecting races of bacteriophage, destroyer of disease germs, is essential for its successful use in the treatment of disease, its discoverer, Professor F. d'Herelle, of the Yale University School of Medicine, said at the New York Academy of Medicine on October 27.

Bacteriophage therapy is still in its infancy and many studies are still necessary before we will learn all the results that we may anticipate, but what has already been done in many diseases justifies the belief that this is the specific treatment *par excellence* and that it will attain a wider and wider application.

Bacteriophage is a parasite that is not able to develop except by penetrating into the interior of a living germ or bacterium, secreting a bacterial solvent, and then reproducing itself by feeding on the dissolved germ. Because of its destructive action on germs, it is being used in the treatment of certain diseases, especially dysentery. Very powerful, less active and very weak races of bacteriophage have been isolated.

Any attempt at treatment with any type of bacteriophage of low potency is to court certain defeat. The *sine qua non* of success is the utilization of bacteriophage races selected with care.

Bacteriophage normally appears in the body of the patient at about the time when he shows signs of recovery from the illness. Treatment by bacteriophage is the best specific treatment because it leads to recovery through a mechanism identical with that of natural recovery.

PSITTACOSIS AND THE IMPORTATION OF PARROTS

THE ban on the importation of parrots into the United States, which became effective last January during the psittacosis outbreak, has been lifted, according to an announcement of the U. S. Public Health Service. Parrots may now be brought into the country through ports where federal quarantine officers are stationed, subject to certain regulations of shipping, detention and inspection.

Shipments are limited to 100 birds each. No more than 10 birds may be shipped in a crate of specified size. These must be constructed in a prescribed manner with special provision for ventilation and cleansing. The parrots must be protected from the weather, especially cold, during the voyage and must be kept clean and be properly fed and watered. All parrot shipments will be detained for 15 days so that their health and general condition may be observed by the quarantine inspector.

An individual returning from the tropics or elsewhere abroad may bring in as many as five privately owned parrots without having them held for the 15-day inspection period. However, these birds must have been kept in a good sanitary environment away from contact with other parrots for at least 60 days preceding their entry to this country.

During the 1929–30 outbreak of psittacosis 169 cases with 33 deaths occurred in the United States. The disease appeared almost at the same time in Argentina, Algeria, Germany, Austria, England, Holland, Czechoslovakia, Denmark, Switzerland, France, Spain, Portugal, Canada, Hawaiian Islands and the United States. In most of the cases, the disease was acquired from infected birds, though a few cases of transmission between humans were reported. The organism causing the disease has not yet been definitely established. Development of the disease in the birds apparently is influenced by the adverse conditions under which they were kept during importation. The disease is probably endemic among the birds of the tropics.

The new regulations regarding imports of parrots are expected to prevent further introduction of the disease into this country. However, the warnings, issued during the outbreak, against unnecessary handling or fondling of the birds, particularly against the practice of feeding them directly from mouth to bill, should still be observed.

PHOTOMICROGRAPHS BY ULTRA-VIOLET LIGHT

A NEW method of taking photographs through the microscope, that will show about a fifth again as much as ones taken with ordinary methods, was announced recently by Dr. A. P. H. Trivelli, of the Eastman Kodak Company, and Leon V. Foster, of the Bausch and Lomb Optical Company, according to a report made to the Optical Society of America, in session at the University of Virginia.

The new method involves taking the photomicrographs with ultra-violet light, which in itself is not new, but which has formerly required the use of special lenses of quartz or fluorite and special slides for the preparation of the material to be examined. For the short ultra-violet rays formerly used, glass is opaque, and so ordinary glass lenses and slides could not be employed. Though Dr. Trivelli and his associate use ultra-violet light, they use waves just a little shorter than visible violet light, that is, waves about 1/70,000th of an inch in length. Expressed in units for wave-length, this is 3,650 ångstroms, an ångstrom being a ten millionth of a millimeter, or about a 250 millionth of an inch. Visible light includes the range of wave-length from about 4,000 ångstroms for the shortest violet rays to around 7,000 for the longest red. Ultra-violet light down to even less than 3,650 is transmitted by ordinary glass lenses and slides, though very much shorter waves are absorbed.

The source of the light is a mercury arc lamp, giving the purple light often used in photographic studios. As the ultra-violet light is not visible, and it is necessary to focus the microscope, they make use of a band of green light in the illumination for this purpose. Two filters are used. One transmits only this green color, and is put between the light and the microscope when it is being focussed. Then another filter, that transmits only the ultra-violet component of the light, is substituted and the photograph made. The lenses are constructed so that both the ultra-violet and the green light rays are focussed at the same place.

Dr. Trivelli showed examples of photographs made with the new equipment. One was of hollyhock pollen magnified 300 diameters. With the picture made by ordinary light a gray ring appeared around the grains, but in the ultra-violet pictures this appeared distinctly as a number of sharp spines.

Ultra-violet photography with the microscope has been used to reveal germs invisible with ordinary means, and with it so much simplified by the method of Dr. Trivelli and Mr. Foster, it is likely that more research workers will be able to use it. The reason that it shows greater detail is found in the short wave-length of the ultra-violet light. The microscope will not show details smaller than the length of a single light wave, so by using shorter waves smaller things are revealed. With X-rays far shorter yet, very much more minute objects might be seen, even the molecules of matter themselves. Unfortunately, no one has yet invented a method of focussing X-rays and they can not be used in this way.

STEREOSCOPIC PROJECTION FOR MOTION PICTURES

No successful means of projecting stereoscopic movies, without requiring some sort of mask or goggles before the observer's eyes, has yet been invented, but members of the Optical Society of America, at the University of Virginia, saw for the first time a method of doing it with still pictures. Dr. Herbert E. Ives, of the Bell Telephone Laboratories, under whose direction their work in television has been carried out, demonstrated the method, which is his invention.

Even with still picture projection the apparatus used is very crude and projected small pictures are visible to only a few at a time. However, the methods used are capable of refinement. But Dr. Ives held out no hope of true stereoscopic movies by such means in the near future.

"These methods are theoretically applicable to the projection of motion pictures in relief," he said. "The complexity and cost of apparatus for satisfactory motion picture projection would, however, be very great."

Dr. Ives's method traces its ancestry to an invention of his father, Frederic E. Ives, inventor of the half-tone process used to reproduce photographs in newspapers and magazines. This was called the parallax stereogram. As with ordinary stereo pictures, intended to be viewed in the double-lens stereoscope, two pictures were made from two viewpoints, separated approximately the distance between the two eyes. These were both printed on a glass transparency consisting of fine vertical strips, so that every alternate strip presented the view seen from one point and the intermediate ones the other. A grating consisting of opaque and clear strips the same width was carefully adjusted and fixed just in front of the picture. Then, when looked at from the correct position, this grating covered one set of strips for the right eye and the other for the left, so the picture stood out in full relief.

Dr. Ives a few years ago elaborated this and made what he called the parallax panoramogram, a device which was invented independently by Dr. C. W. Kanolt, formerly of the Bureau of Standards. This was taken with a special form of moving camera. The result was a picture made up of strips, but each strip consisted of a minute panorama of that part of the subject, from a number of viewpoints. This was viewed through a grating, in which the clear strips were much narrower than the opaque ones, so that when viewing the picture from any direction the eyes saw the parts photographed from a similar direction. When looked at with two eyes, each saw the proper part and stereoscopic relief was obtained. The advantage of this was that the picture did not need to be viewed from a certain angle.

Dr. Ives has now developed this further. In one method he replaces the grating with a film on which are embossed narrow vertical ribs, like those used for amateur color motion picture film. The ribs act as cylindrical lenses, directing the light the same way as the clear strips in the grating, but are not as wasteful of

light. Another improvement is obtained with this film to produce a stereoscopic picture that does not need to be viewed with the light behind, but can be handled like an ordinary photograph.

For projection, Dr. Ives has worked out two methods, both of which he demonstrated. In one, the screen is made up of a series of vertical glass rods, each designed so that the light is reflected back in the same way that it came. A battery of many lanterns all project on this screen, each projecting a view of the original subject made from a particular angle. Each picture can be seen from only one direction, so each eye sees its proper picture, but for satisfactory results an enormous number of separate projectors would be needed.

The other method is to use a screen of rods, so shaped that when viewed, one sees only light from a very narrow strip on the back. By means of a very accurate lens, a parallax panoramogram, as used for the smaller pictures, is projected on the back of this screen, and the strips of the pictures registered with those of the screen with great precision. Then, when viewed from the front, the audience sees a stereoscopic picture. Neither method is practicable for motion pictures under present conditions, because of the large number of separate films and projectors that would be required for the first and the extraordinarily great accuracy needed in the projection of the second.

ITEMS

EXCELLENTLY preserved fossils of sea-going whales which visited the Michigan peninsula during the ice age have been discovered in two localities, according to an announcement made by Professor Russell C. Hussey, of the department of geology of the University of Michigan. Some twenty to thirty thousand years ago the whales swam inland by way of the St. Lawrence or the Hudson waterway, through the prehistoric glacial lakes and into shallow rivers at the edge of the retreating ice sheet which then covered northern North America. The whales caught in the rivers could not turn around and find their way out, and Professor Hussey believes they must have died of starvation. Their bones were cast upon the beaches of those times and are found to-day in gravels. As found at both localities, one ten miles south of Ann Arbor and the other in Oscoda County in the northern part of Michigan, the bones are bleached white with backbone and ribs perfectly preserved. The University of Michigan hopes to acquire one skeleton for exhibition purposes.

IN the higher reaches of the Rocky Mountains in the northern portion of Montana lives a species of mosquito that hibernates during the winter as adults, under logs and in sheltered spots, and may be seen flying on the first warm day of spring. These mosquitoes are large, with spotted wings, and often are referred to as snow mosquitoes. According to Drs. N. Kadletz and L. Kusmina, of Russia, these mosquitoes store up fat in the summer, as do bears, and subsist on it while dozing through the winter.

A CLUE to life during the Triassic Period has been yielded by fifteen tons of earth from the banks of the Little Colorado River, east of the Grand Canyon in Arizona. Barnum Brown, of the American Museum of Natural History, and L. I. Price, of Oklahoma University, sifted this material through fly screens to recover the remains of the probable reptile ancestor of the dinosaurs and the phytosaurs. The siftings from the fossil earth were hauled ten miles to a spring before the fragments could be washed and looked over. This process required three weeks of patient work and rewarded the investigators with only enough fragments to cover the bottom of a cigar box a half inch deep. But these fragments were enough to enable the scientists to restore the rare little beast that lived before the dinosaur and is believed to be ancestor to it and to another ancient reptile, the alligator-like phytosaur. The small ancestral reptile is about three feet in length.

A STUDY just reported by the Milbank Fund has shown that the young industrial worker is more apt to get sick than the older employees. On the whole, workers in industry are healthier than the general population. The statistical analysis of the study was made for the fund by Dean K. Brundage, of the U. S. Public Health Service. The fact that the older employees are healthier than the younger ones and likewise healthier than men and women of the same age groups outside of industry can probably be explained on the grounds that the healthier individuals tend to remain in industry to a greater extent. Industrial workers appear, in the main, to be the flower of the general population in physique and constitution. Women workers tend to be absent because of illness from 50 to 100 per cent. more often than men, especially for short periods. Married women were absent much more than single women.

MILWAUKEE, Wisconsin; Syracuse, New York; East Orange, New Jersey; White Plains, New York, and Sidney, Ohio, were the winners in the first Inter-Chamber Health Conservation Contest sponsored by the U. S. Chamber of Commerce, it was announced at the recent meeting of the American Public Health Association. The health departments of the five cities were awarded certificates. The object of the contest: "To assist in reducing economic losses in the United States due to unnecessary illness and death. It is hoped to do this through the organization of health committees of local chambers of commerce or similar associations which assume leadership in cooperating with the official and voluntary health agencies of the community." The contest for 1929 was so successful that a similar one has been started for 1930, and 183 cities have already enrolled. The only requirement for enrolment is that the local chamber must be affiliated with the Chamber of Commerce of the United States. As in the previous contest, the services of technical experts of the American Public Health Association will be available, without charge, to assist health departments of contesting cities in mapping out a program or in any other way.