SCIENCE NEWS

Science Service, Washington, D. C.

THE NEW COMET

RYVES'S comet, discovered by an English amateur astronomer living in Spain, will probably be visible low in the western evening sky, just after sunset, for a few days. Mr. L. E. Cunningham, of the Harvard College Observatory, has made a preliminary computation of its orbit. This indicated that the comet would be at perihelion, or closest to the sun, on August 25.

After that, according to the computations, which are admitted to be somewhat uncertain, it will be in the constellation of Leo, and of the minus 3.4 magnitude. This is almost as brilliant as Venus at its brightest, and brighter than any other permanent astronomical object except the sun and moon. At that time it will be about seven degrees from the sun, and may be even visible in broad daylight. At noon when the sun is directly south, it should be seen to the left of and a little below the sun, if that body's direct glare is obscured behind the edge of a building or in some similar way.

Incidentally, this position is only about three degrees away from the position of Nagata's comet when it was discovered by a Japanese amateur astronomer in California a few weeks ago. Then, however, the sun was considerably farther away.

Mr. Cunningham's computations of the orbit are based on observations of Ryves's comet made on August 14, by Dr. George Van Biesbroeck, of the Yerkes Observatory, Wisconsin, and on August 15 and 17 by Dr. E. C. Bower, of the Lick Observatory, California. Three separate positions of a comet are necessary to determine its orbit. However, if the three are very close together, as was the case with those used by Mr. Cunningham, any slight error is greatly magnified. Only by using three observations spread over a wide arc of the comet's orbit can really precise computations be made. For this reason, Dr. Harlow Shapley, director of the Harvard College Observatory, in announcing Mr. Cunningham's results, states that further observations of the comet are urgently needed.

Though the present computations are very uncertain, they should permit the comet to be kept in view. Without them it might be completely lost, as has happened in the past.

ELECTRONS AND THE BLUE OF THE SKY

ELECTRONS streaming from the sun may be the cause of our familiar but mysterious blue sky, Dr. Willi M. Cohn, of the University of Berlin, has concluded as the result of his experiments in which a blue light very similar to that from the sky was produced in the laboratory. Dr. Cohn is engaged in high temperature research at the A. D. Little laboratories at Cambridge and will start researches at Harvard in the fall.

Dr. Cohn experimented in Berlin with cathode rays in a high vacuum, formed in a tube similar to the x-ray tube. He allowed the stream of electrons, which is the cathode ray, to meet larger electrically charged particles of matter, known to scientists as ions, which are formed either from a piece of radioactive metal, such as thorium, or from a gas. The blue light appeared where the electrons and the ions came together.

This blue light can be broken up by prisms to form a spectrum or "rainbow" of continuous color, just as is found in sunlight. The blue light from the clear sky also shows a continuous spectrum, although gases, such as the air this light passes through, have quite different spectra showing only thin colored lines. Dr. Cohn points out that at the upper layers of our atmosphere, electrons continually arriving from the sun and ions of the gases which form our air meet in the intense vacuum of space. Since under such conditions in his laboratory the blue light which is so like the light from the blue sky is formed, he believes that the blue of the heavens may, at least partially, have the same cause as that of the laboratory.

Since the time of Newton investigators have speculated on why the sky is blue. The most successful explanation heretofore has been that of Sir John Tyndall and Lord Rayleigh in the last century, which considers it due to sunlight broken up in a particular way by spherical particles in the atmosphere. Dr. Cohn states that his theory does not conflict with the older one so far as direct sunlight is concerned. He points out that the Tyndall-Rayleigh theory would expect the light from the sky to be polarized so that all its waves would vibrate in a particular way. The light produced by Dr. Cohn in the laboratory is not polarized, and daylight is only partly polarized, partly not.

TREATMENT FOR HOOKWORM

A SAFE and apparently certain treatment for hookworm has been found in the synthetic antiseptic hexylresorcinol. This important discovery in the field of medicine was announced by Dr. Veader Leonard, of the School of Hygiene and Public Health of the Johns Hopkins University, before the Section on Tropical Medicine of the Third Pan-American Medical Congress at Mexico City.

Dr. Leonard himself first described the bactericidal properties of the drug, but not the fact that it is effective against hookworm and ascaris. Since 1924 it has been known that the synthetic chemical, hexylresorcinol, is seventy times stronger than carbolic acid, and at the same time practically non-toxic to man. It has been used as a general, as well as internal, antiseptic the last few years.

Dr. Paul D. Lamson, professor of pharmacology at the Vanderbilt University School of Medicine, discovered its potency in hookworm disease and ascariasis, while investigating the problem of safe remedies. The work was sponsored by the International Health Division of the Rockefeller Foundation.

Hookworm, the "disease of backwardness," is one of man's oldest diseases, for its symptoms are apparently

described in ancient Egyptian papyri. In present times it is claimed that half of the world's population lives in areas where it is prevalent. Millions of people are infected by it, and the havoc it does is incalculable.

It is a disease that could be controlled by hygienic means, Dr. Leonard stated, but it is difficult to obtain the cooperation of the masses affected by it. The ignorance of the classes that generally have it is the stumbling block.

"The statement can be made without reservation," Dr. Leonard said, "that there is not a single anthelmintic (anti-worm) drug now in common use, which has not caused prompt fatalities by the administration of average doses." Because of its dangers, the use of thymol has been largely superseded by carbon tetrachloride, a common cleaning fluid. But carbon tetrachloride may prove fatal in small doses to persons deficient in calcium.

Santonin, a classic remedy for ascariasis, infection by common roundworms, is one of the most expensive drugs in the pharmacopeia, and may produce serious poisoning in very small doses, while it may be fatal in average doses. Oil of chenopodium, given in place of this drug because of its expense, has to be given with care to debilitated persons. Many fatalities have occurred, for its toxicity varies and it has never been standardized.

The problem in America, Dr. Leonard says, is largely a matter of the control of the two parasites—hookworm, and ascarids or common round-worms. Both carbon tetrachloride and oil of chenopodium are specific against only one of these parasites, while many patients have both. Treatment with carbon tetrachloride is sometimes dangerous. While it may kill the hookworms, it irritates the ascarids and causes them to begin a migration to escape the drug which may be fatal to the patient.

The new drug, hexylresorcinol, is effective against both parasites, and against even a third, Trichuris trichiura. The chemical is easy to take, has no bad after-effects, and seems to be one hundred per cent. efficient when directions are followed. It is effective in this instance only in its crystalline form, made into sugar-coated pills. Four tenths of a gram is enough for children under six, while one gram is enough for persons twelve or over. It must be taken on an empty stomach and no food should be eaten for four hours afterwards.

Dr. Leonard does not yet know whether this drug will be as effective against European hookworm as against the American, or less so, as is true of carbon tetrachloride. It is not known whether it will be useful against other nematodes parasitic to men, and cestodes. Present results are based on experiments made with about 1,500 persons in the United States. Other investigations now on foot in Japan, China, the Philippine Islands, India, Siam, Egypt, the southern part of the United States and Mexico may answer these questions.

RINGWORM INFECTION OF THE FEET

A COMMON chemical used in purifying city water supplies, sodium hypochlorite, has been found by two Buffalo workers in medical research, Dr. Earl D. Osborne and Miss Blanche S. Hitchcock, to be an effective preventive of ringworm infection of the feet. This disease, also known as "athletic foot" and similar nicknames, has spread spectacularly with the post-war rise of sports involving the use of common dressing-rooms and other gathering-places where athletes trample around barefooted for a time. There the spores of the fungi that cause the disease are spread from foot to foot, later causing irritation, cracks and itching watery blisters.

Dr. Osborne and Miss Hitchcock state in their report to the official publication of the American Medical Society that they have not been able to find a record of sodium hypochlorite being used or suggested as a fungus-killer before. They made some preliminary trials with cultures of various fungi in test-tubes, using solutions of the chemical in concentrations stepped up from one thousandth of one per cent. to one half of one per cent. The latter concentration seemed the most effective and was chosen as standard for a clinical trial.

With the cooperation of the physical training department of the Buffalo high schools, heavy rubber pans were installed in all the gymnasiums, and students going to and from gymnasium classes were required to wash their feet in a one half per cent. solution of sodium hypochlorite. The solution was renewed every day. In a new high school a shallow "well" for the solution was built into the corridor passing from the dressing room to the showers. Later, the strength of the solution was increased to a full one per cent. because of possible dilution through use.

The results of the experiment are reported as most encouraging. The spread of the infection was completely checked. The two experimenters report that "the records fail to show a single new case, although numerous ones have appeared from the surrounding towns."

The hypochlorite solution, however, is not to be looked upon as a cure for already established cases. The report continues: "So far as cure of the disease is concerned, we do not believe that 0.5 per cent. solution hypochlorite or even 10 per cent. sodium hypochlorite would be any more efficacious in curing an established case than any other methods employed at present in the treatment of this stubborn condition."

The sodium hypochlorite treatment is the second efficacious prevention for ringworm of the feet reported recently. A short time ago Dr. W. L. Gould, of Albany, N. Y., described how he had stopped the spread of the disease in the junior high school there with a 10 to 15 per cent. sodium thiosulphate solution. Dr. Osborne and Miss Hitchcock, however, believe that their sodium hypochlorite solution offers certain advantages. It is cheaper, and when the quantities used in gymnasiums and similar places are considered this is a distinct consideration.

PSYCHOLOGICAL TESTS OF AVIATORS

PERSONALITY, as shown in a psychological examination, is an excellent index to whether a man will "make the grade" as a naval flyer, according to a report made by Lieutenant C. G. De Foney, of the U. S. Navy Medical Corps, in the *Medical Bulletin*.

The most important factors distinguishing the good flyer from those who fail are courage and emotional stability. More similarity exists between aviation successes and failures in regard to intelligence and ability to concentrate.

"This apparent lack of influence on the ability to pass the course was anticipated in so far as intelligence is concerned, since the students were, for the most part, selected material of the same general average intelligence."

"The highly intellectual individuals, the bookworms and grinds who had previously reported for training at Pensacola had not done so well as a group; a very low percentage of this type complete the course. This is easily explained, since this type of individual is usually the poorly rounded out personality, the poor mixer, the introspective, overly serious, sensitive individual who enlarges on the possibilities of danger and failure. This type fares poorly under the present system of trial flights at frequent intervals with a check pilot.

"It has also been noted that the mentally dull, self-satisfied, extraverted individual does much better here for the opposite reasons that he is either too dull to know when he is in trouble in the air, would not admit it if told that he was and is not thinking of the future or possibilities; he lives only in the present moment and hence is relieved of the mental load that the previous type mentioned carries.

"This second type, however," according to Lieutenant De Foney, "being indifferent to dangerous situations and possibilities, is the careless flyer who is always having real or near collisions in the air, beach crashes, grandstanding for the crowd's applause, and causing much repair work on previously good airplanes."

Of the men selected on the basis of psychological examination as being good aviation material from the standpoint of intelligence and emotional make-up, only 30 per cent. failed to make good. Of those set apart as being poor material only 32 per cent. were able to qualify and nearly half these required extra instruction. The crash rate is more than double among those called poor aviation material than among those who did well on the psychological examination.

ITEMS

WITH the new dirigible, *Akron*, soon ready to give more definite test to the practicability of trans-Atlantic air travel, the vicinity of Richmond, Washington and Baltimore is under consideration as the location of a possible terminal for such commerce. Philadelphia has also been included in the group as being the most northerly point in the suitable area. The locality of these four cities was recommended by Ward T. Van Orman, of the Goodyear-Zeppelin Corporation, builders of the *Akron*, after a thorough investigation of weather conditions along the Atlantic seaboard. The U. S. Weather Bureau cooperated in obtaining for him the necessary climatological and meteorological data. At present, devices to measure wind speed and direction have been erected at these cities and the resulting records will determine largely which one is to have the new air harbor.

POLLUTION of inland and coastal waters in the United States as a whole is decreasing. Twenty-five of the forty-four states questioned by the joint committee on oil pollution of the American Engineering Council reported an improved condition. In eleven states oil pollution was believed to be on the increase, while in six states the question was regarded with doubt.

THE largest living thing on earth is the General Sherman sequoia tree in Sequoia National Park. A committee of engineers has completed precise measurements of the big trees of California and has awarded the championship to this tree, with the General Grant tree second. Over a thousand observations and calculations with precise engineering instruments, showed that the General Sherman giant redwood has a volume of 600,120 board feet, a height of 272.4 feet, a circumference at the ground of 88 feet and one limb alone has a diameter of 6.8 feet. The General Grant tree contains only nine tenths of the volume of the General Sherman tree but it is larger around at the base, higher and probably older. The giant sequoias are considered the oldest living things on earth, having ages estimated to be 4,000 to 5,000 years.

TIMBERS placed atop untreated pine piles saved the day along a two-and-a-half-mile stretch of swampy North Carolina land where the concrete road had sunk so far as to be impassable. The novel timber bridging was constructed directly over the old roadway. Spaced ten feet apart, the piles were driven deep into the oozy mud in lines on both sides of the old roadbed. Caps made of concrete encased the tops of the piles in order to provide a firm basis for the timber decking. A layer of asphaltic concrete covered this decking of the emergency road. While the piles were being driven it was still possible to leave a minimum of 13 feet of the old road open to traffic.

How does the pigeon find his way home? Many of the theories heretofore advanced involve the idea of a special sense of direction, but experiments conducted by Dr. Ralph H. Gundlach, of the University of Washington, indicate that the correct explanation is probably that these birds have good vision, wide cruising range and some special motivation. Dr. Gundlach constructed a maze in such a way that only a creature having a directional sense would be able to solve it. The experienced homers tested showed no sign of reaching a solution even after three months of trial. Another test was to release 16 trained racing homers on a course lying in a direction from home different from that of the course on which they were trained. These racers were accustomed to covering 100 miles in two hours on their home course. On the new one in which they had to find their way only three came home in less than five hours. Six were out from one to 14 nights, and two never came home at all.