SCIENCE NEWS

Science Service, Washington, D. C.

NEW THEORY OF LIGHT EMISSION

A NEW theory of the emission of light, formulated with aid of the Einstein view of time and resulting in amazing conclusions, was announced by Professor Gilbert N. Lewis, of the University of California, who is delivering the annual Silliman lectures at Yale University, New Haven, Conn., this month.

In his lectures Dr. Lewis made a survey of the concepts of science, and he had led up to the relativity theory and its applications. He pointed out that all the formulations of physics have already been re-formulated under the space-time geometry of relativity. The theory of radiant energy has in part resisted such formulation. Dr. Lewis proceeded to demonstrate that, by further extension of the Einstein view of time, it is possible to bring radiation completely into accord with the new geometry.

A new and remarkable concept of the emission of light is necessary, Dr. Lewis contends. The energy of light is corpuscular and the corpuscles act entirely like material particles, nevertheless each particle obeys the laws of the interference of light. Light can never pass to a place where optical theory predicts a dark interference band. Dr. Lewis suggests that atoms do not emit light promiscuously into space but only to other atoms. It is not emission but transmission, in which the emitting atom and the receiving atom play symmetrical and equally important parts.

Dr. Lewis's new theory involves the amazing conclusion that what we do now determines whether certain light particles shall have left a star a thousand years ago although in ordinary parlance the star may meanwhile have disappeared. This seems absurd only because of our habits of using space and time, Dr. Lewis explained.

In relativity geometry the distance between the event of emission and the event of absorption of light is zero. Because of this, Dr. Lewis says: "My eye touches the star not in the same sense but in just as truly a physical sense as my finger touches the table.

"I do not wish to minimize the conflict between this view and that of common sense," Dr. Lewis explained. "The light from a distant star is absorbed by a molecule of chlorophyl in a leaf which has recently been produced in a living plant. We say that the light from the star was on its way toward us a thousand years ago. What rapport can there be between the emitting source and the newly-made molecule of chlorophyl? Suppose by interference we prevent a particle of light from reaching a point. Do we thus prevent its original emission in just that particular direction? If so it means that we can, in a trivial way but nevertheless in principle, alter the course of what we call past events."

As a crucial test of the new theory, Dr. Lewis proposes a simple experiment based upon the pressure and interference of light. If the results of this test prove to be positive it will, like the Michelson-Morley experiment, require a great change in the traditional view of space and time, and further demonstrate the validity of the relativity geometry. The technical formulation of the new theory is embodied in a paper now in publication in the Proceedings of the National Academy.

BLOOD PRESSURE AND LIVER EXTRACT

DR. W. J. MACDONALD, St. Catharines, the Ontario physician who addressed the Toronto Academy of Medicine recently on the use of liver extract in the treatment of high blood pressure, has denied the misappropriation of information from the University of Western Ontario at London, where the claims of Drs. A. A. James and N. B. Laughton to priority has the full endorsement of the staff of the medical school. "I possess documentary evidence in support of my position, which will be available for publication if necessary," Dr. Macdonald declared. The London workers have challenged him to produce the evidence.

All parties are agreed, however, that Dr. Macdonald was the first to use extracts of liver for the treatment of human beings. His opponents claim he copied the methods already in use on animals, and that he was advised to watch for a drop in blood pressure, when he first administered the extract to humans for another purpose. Dr. Macdonald on the other hand asserts that the possibility of using liver extract to reduce hypertension is entirely his own idea.

Professor J. J. R. Macleod, in whose laboratories at the University of Toronto the researches are being continued, stated that Dr. James and Dr. Laughton had lowered blood pressure in animals with both histamine and liver extract when Dr. Macdonald was first associated with them.

The London biochemists are working steadily on the theoretical aspect of depresser substances, disclaiming any desire to "commercialize" their knowledge. Their claim to originality is backed by Dr. A. B. Macallum, professor of biochemistry at McGill University, Montreal, whose reputation is world wide. He said: "Drs. James and Laughton had demonstrated a liver substance capable of lowering blood pressure before Dr. Macdonald went to London to work in October, 1924, when he began another problem which had a futile ending within three weeks, but during which period Dr. Macdonald learned of the effect of this extract on blood pressure."

Dr. Macdonald himself gives "recognition" to the London work. The rival claims will probably be fought out in court. Both parties have applied for Canadian patent rights, and in view of the dual application, a court hearing, with evidence offered under oath if necessary, will take place before either side is given a title.

Officials of Canadian universities who have followed the dispute express disappointment at the attitudes of the two factions, indicating that the altruistic spirit with which a medical discovery should be regarded, has

long since been forgotten. A similar lack of harmony marred a previous important discovery, it is stated.

The incident will have the unfortunate result of cluttering scientific literature, already appalling in its volume and complexity, with the half-considered and unconfirmed conclusions of individuals anxious to ensure priority. Fear is also expressed that cooperation, essential for rapid progress in this field of science, will be entered into with increasing diffidence.

BRITISH CANCER DISCOVERIES

LIGHT on the so-called lead cure, Dr. W. E. Gye's announcement of cancer inoculation tests, and other recent British cancer discoveries is to be sought by Dr. Francis Carter Wood, of the Institute of Cancer Research of Columbia University, who sailed for Europe on December 9. Dr. Wood, who is vice-president of the American Society for the Control of Cancer, will make an official report of his investigation to the society on his return to this country.

"Reports of British cancer discoveries which are arousing so much attention are often misleading and incomplete," said Dr. George A. Soper, managing director of the society. "We are prepared to give the widest publicity to any new facts, providing they are really well established. But the American society deplores premature and sensational announcements made by the press, which arouse false hopes among cancer patients.

"Due to the public's eagerness for information which will make the cancer problem clear, the words and meanings of those who talk about their discoveries are often misconstrued, and the practical value of the work grossly exaggerated. For example, in the case of the Gye and Barnard discoveries the impression seems to have obtained currency that if these gentlemen are right the cure of cancer is in sight. In my conversations with Dr. Gye last summer, he expressly wished it understood that this is far from being his view.

"It is not enough for cancer experiments to be done once. They must be checked carefully. And in many cases the value of the work can be completely established only by numerous independent researches. Some of the recent announcements of the most startling character are by men of high training and ability, but the history of cancer research, as well as experience of hospitals for many years, has shown that even the most careful scientist may be occasionally in error. The public should accept with caution all announcements as to the cause and cure of cancer, and judgment should be suspended until the work reported can be fully confirmed."

A NEW ANESTHETIC GAS

PROPYLENE, one of the constituents of illuminating gas, is being used as an anesthetic in connection with major operations in a hospital in New Orleans. Dr. J. T. Halsey, of Tulane University, reports satisfactory results.

This is a new step in the use of ingredients of common illuminating gas for anesthetic purposes. Ethylene, which belongs to the same chemical family tree as propylene, is already extensively used by dentists and in clinics and hospitals. But propylene is more than twice as potent, so that more oxygen can be administered with it, thus minimizing danger to the patient's breathing.

Butylene and amylene, two other members of the same family, are still more powerful, amylene having fifteen times the strength of ethylene. These two, however, are impractical for hospital use because they arouse marked nervous symptoms, which are not noted in reactions to the weaker gases.

Dr. Lloyd K. Riggs and Harold D. Goulden, of New Brunswick, N. J., who have made extensive studies of propylene with white rats, report that they have tried this gas experimentally on fifteen human subjects who volunteered for the tests.

The higher concentrations of propylene quickly produce unconsciousness. Recovery is rapid, consciousness returns within one minute after administration of propylene is discontinued, and only one of the fifteen subjects was nauseated.

One of the two investigators allowed himself to be put under influence of propylene to the point of unconsciousness three times in one day, without any ill effects except a slight lack of coordination of his muscles which lasted for about fifteen minutes after the return of consciousness.

CHRISTMAS GREENS

Go slow on the Christmas greens, there aren't any "more in the kitchen." This, in effect, is the warning sounded by Dr. P. L. Ricker, president of the National Wild Flower Preservation Society. Unless the present generation extends the principles of conservation to holly and ground pine as well as to the big forest trees, there may not be any of the favorite holiday decorations for their children to enjoy.

A large part of the holly, laurel and other Christmas decorations appearing on the market are gathered by men from the cities who do not own the woods where the bushes grow. That is, these greens are virtually stolen, though the owners may be indifferent to the practice. The greatest danger to our stock of decorative winter plants comes from the careless and destructive methods of collecting employed by these men.

Mr. Ricker recommends that owners of woodlands where winter greens grow should themselves take care of the systematic marketing of their own produce, so that waste may be ended and the profits go where they are lawfully entitled to go. As further conservation measures on the part of the consumer he suggests an increased use of artificial wreaths and garlands and the keeping of live Christmas trees in tubs, so that they may be used year after year. He also recommends the cultivation of potted plants for the same purpose, and especially the cultivation of domestically-grown holly.

THE FORD EXHIBIT AT THE MUSEUM OF THE PEACEFUL ARTS

HENRY FORD has contributed the first exhibit for the Museums of the Peaceful Arts which are to be established in New York City, according to a statement just made

by Dr. George F. Kunz, president of the association which is establishing the museums. The gift is a set of fine gages running from one hundred thousandths of an inch up to four inches, and is the work of E. C. Johannsen, internationally known as a maker of gages.

"The museums are to be like the great industrial museums of London, Paris, Berlin, Munich and Vienna," Dr. Kunz stated. "They are not to contain single historical machines, which would be interesting only as curiosities, but they are to show the development of the industries and peaceful arts in America, so that young men and women can study the background and trend of the arts they are promoting. It has been said that no single workman in a shoe factory to-day knows how to make an entire shoe.

"There will be permanent exhibits of electricity, astronomy and navigation, steam, safety appliances, mechanical arts, health and hygiene, ceramics, agriculture, printing and books, commerce, roads and architecture. There is to be a library containing books on these subjects. If there had been such a museum for reference in this country during the war, it would have saved the United States billions of dollars."

The museum association has received a gift of $50,000 through the will of Henry R. Towne, of New York.

THE AMERICAN WHEAT CROP

ONE out of every twelve wagon loads of wheat is the annual loss due to illness of the American wheat crop. The U. S. Bureau of Plant Industry has estimated the yearly loss on account of plant diseases of some of the major crops.

The cotton crop pays even more dearly, for the diseases of the cotton plant levy a payment of one bale out of every eight. Nearly one bushel of Irish potatoes is lost out of every five, and over one bushel of sweet potatoes in every six. Diseases of the corn plant cost about one bushel in eleven.

In five years' time from 1919 to 1924, the loss of wheat from plant diseases has dropped from 17 to about 9 per cent. Losses in sweet potatoes have dropped significantly from 36 per cent. in 1919 to less than 18 per cent. in 1922, while cotton crop conditions have fluctuated from a loss of about 14 per cent. to 19 per cent. in this time.

Stem rust is the most serious ailment of wheat and rye, while root and ear rot cause most of the damage in corn. Leaf roll is the most important of the many potato diseases.

The host of diseases which menace certain important crops in the United States present a serious economic problem in American agriculture. Plant diseases, together with insect pests, take a large slice out of the national income yearly.

ITEMS

SOUTH AFRICA is coming into its own as a land of valuable deposits. Added to its diamond and radium mines is the possibility of a large store of platinum. Dr. Percy A. Wagner, of the Geological Survey Office at Pretoria, Africa, reports that discoveries of platinum made in the autumn of 1924 are economically important. Deposits which have been located are of enormous extent, but only a limited area is conclusively proved rich enough in platinum to be profitably exploited. Dr. Wagner points out, however, that the samples which have been taken on the surface or immediately below it may indicate richer ore hidden deeper. "The value of the deposit can not be estimated until a number of shafts are sunk to, say, 20 feet below the surface and samples of the rock systematically taken," he states. The deposits of the Lydenburg District were first discovered by a farmer who was looking for gold. He came upon a few specks of a heavy white metal which looked to him like platinum, and a consulting geologist at Johannesburg confirmed his judgment as to the value of the ore. Geologists say that they have expected to find platinum in this section of the Transvaal, but heretofore the metal has been sought mainly in chromite rock. The platinum fields now under investigation are in the norite zone. Dr. Wagner says that conditions are favorable to cheap mining. A number of mining companies have acquired options over farms of the platinum region, and some prospecting is going on.

No longer need a clothing store salesman take a suit to the window to show the prospective customer the effect in daylight, or even turn on a special light. Instead, he will soon be able to hand the customer a pair of daylight spectacles, which have been invented by Dr. Hermann Weiss, of Vienna. Already they have come into wide use in laboratories in the textile, paper and dye industries, where it is often necessary to judge the color of solutions. They are of blue glass which absorbs some of the yellow rays in which the ordinary incandescent lamp is rich but which are not present in such abundance in sunlight.

THAT the lowly ant is as sensitive to heat and to cold as human beings, and that the ant prefers his temperature not too hot and not too cold, is shown by a report from D. F. Miller and M. Gans, of Ohio State University. A group of ants in going to and from their nest were found to traverse a certain path on the face of a stone. On one side of this path a covered electric light bulb was placed to serve as a source of controlled heat. On the other side was placed a brine coil enclosed in an iron can from which a draught of cold air could be made to cross the path. The closer the source of heat was placed to the path, the more the ants deviated in passing this spot. With the heat turned off and the cold draught operating, the ants again deviated in passing the spot which was cold. The hot rays from the sun were found to be as effective as the artificial heat. At noon when the sun's rays beat directly down upon the path of the ants they sought to avoid the heat by deviating, but finding it impossible to dodge the heat in this manner, they speeded up their travel and simply ran away from the heat.