# SCIENCE NEWS

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## PATENT FOR AUTOMATIC "ELECTRIC EYE" CAMERA GRANTED TO DR. ALBERT EINSTEIN



DR. ALBERT EINSTEIN, proponent of relativity and acknowledged leader of the science of mathematical physics, stands revealed on the records of the U. S. Patent Office in Washington as the inventor of a camera which snaps photographs with the proper aperture and exposure automatically determined. He has applied the photoelectric cell or "electric eye" to cameras. Experts reading the patent specifications foresee the possibility that the invention will be practically and commercially important in the next few years. The patent is No. 2,058,562 and the application was filed on December 11, 1935, by Dr. Einstein jointly with Dr. Gustav Bucky, of New York City.

This is the way the Bucky-Einstein camera works: Light from the scene or object being photographed comes into an auxiliary lens and falls on the photoelectric cell. There is a screen of varying transparency mounted in the main camera lens system that is moved in accord with the amount of light that the electric eye sees, letting more light fall on the photographic plate when necessary. So far as can be judged, abstruse mathematical theory was not needed in designing the patented camera but Einstein's genius probably contributed largely to making it operate correctly. What plans Dr. Bucky and Dr. Einstein have for commercializing the invention are not yet known. The device can be adapted to motion picture cameras.

Dr. Einstein is the leading member of the Institute for Advanced Study at Princeton, N. J., which works in co-operation with Princeton University, but is not a part of it.

Dr. Bucky is a radiologist practicing in New York City, with offices at 5 East 76th Street, and is also connected with New York University. Dr. Bucky is a naturalized American citizen of German birth. He practiced in Berlin until 1923 when he came to America. He is the inventor of a diaphragm in general use in x-ray photography.

A search of the U. S. Patent Office files showed that Dr. Einstein is also a co-inventor of two other patents. These relate to refrigeration and were taken out jointly with Leo Szilard, who is believed to be the well-known radiologist at St. Bartholomew's Hospital, London. These two patents, British No. 282,428, granted November 15, 1928, and U. S. No. 1,781,541, granted November 11, 1930, cover a new system of circulation in the gas-type of refrigeration and the use of butane gas as the refrigerant. The U. S. patent is assigned to the Electrolux-Servel Corporation of New York and is believed to have been commercially profitable.

## GIFT TO THE GOVERNMENT OF A PATENT ON A NEW, SAFER MORPHINE

ONE week after the destruction by the Bureau of Engraving of $15,000,000 worth of the narcotic drug, heroin, the Secretary of the Treasury accepted the patent rights to another narcotic drug. This is the new, safer morphine prepared by Dr. Lyndon F. Small, of the University of Virginia. Dr. Small formally presented his patent rights to Secretary Morgenthau on December 1. Both these seemingly contradictory actions are being taken as part of the government's fight to control the evil of narcotic drug addiction.

The destruction of the heroin was in conformity with regulations of the International Narcotics Convention. Heroin, a morphine compound, is considered the most vicious of habit-forming drugs. The new morphine prepared by Dr. Small will, it is hoped, prove to be without addiction, or habit-forming, properties. The goal of a non-habit-forming morphine is being sought in a fundamental attack on narcotic drug addiction launched in 1929 by the National Research Council, the U. S. Public Health Service and the U. S. Bureau of Narcotics. The research on morphine substitutes is being carried on at the Universities of Virginia and Michigan.

A morphine compound which it was hoped would be without addiction properties was prepared and patented by Dr. Small two years ago. The patent rights on this were also turned over to the Secretary of the Treasury by Dr. Small. When clinical trials showed that the compound was more habit-forming than ordinary morphine, the Surgeon-General of the U. S. Public Health Service recommended to the Secretary of the Treasury that the United States Government prohibit the importation, manufacture, sale or distribution of this drug in the United States. The latest morphine prepared and patented by Dr. Small is less poisonous, more powerful in relieving pain and acts longer than ordinary morphine. Whether it will be equally, more, or less habit-forming than ordinary morphine can not yet be told. Clinical trials to determine this point are now under way, but have not been concluded.

## INVENTION, THE PATENT SYSTEM AND INDUSTRIAL PROGRESS

SCIENTIFIC and inventive ability, and a patent system which fosters and protects them, have made the United States world leader in material progress, according to Dean Dexter S. Kimball, of the College of Engineering of Cornell University, in a speech made in Washington, on November 23, in connection with the Centennial Celebration of the American Patent System.

"The census of 1850 records the national wealth as $7,135,780,228 and the *per capita* wealth as $308. The census of 1930 lists the national wealth as $329,700,000,000 and the *per capita* wealth as $2,677. The United States, with about seven per cent. of the world's population, owns half the world's communication facilities, nearly half the world's railways, has one automobile for every five persons, whereas the four other leading nations have one for every 59 persons; has one telephone to every seven persons as compared with one for each 35 in the other leading four nations, and one radio for every six

persons as against one for every 17 in the same lands. How could all this have been accomplished except through the application of these great inventions to our unparalleled national resources?''

During depressions, caused by upsets of the delicate balance of the modern business system, a cry goes up against technological unemployment. This cry ignores the fact that the present economic levels could only have been reached by the use of machines. Moreover, the cry against machines in the last depression occurred when, even at its lowest, the economic status of the people was still immensely better than the best living of the average workers before the industrial revolution—introduced by machines—started near the end of the eighteenth century.

## DISCOVERY OF TITANIUM IN INTERSTELLAR SPACE



DISCOVERY in far-off interstellar space of what is probably ionized gas of the element titanium, which astronomers say is likely to prove of great significance in learning the content and nature of these nearly vacuous regions, has been reported to the Harvard Observatory by the Mount Wilson Observatory in California. The discovery was made by Dr. Walter S. Adams, director of the Mount Wilson Observatory, and Dr. Theodore Dunham, a member of the staff, while they were conducting research on the ultra-violet part of the spectrum of the bright star Chi 2 Orionis.

Harvard astronomers said: ''It seems probable that if the discovery of the interstellar titanium is confirmed it will give information concerning the content and nature of interstellar space that is of more importance than was the discovery of the sodium and calcium of nearly empty space.'' Dr. Adams and Dr. Dunham reported that the star Chi Aurigae also shows the new titanium lines and it is probable that further research on the spectra of the hot stars will reveal the presence of this intervening matter in all directions from the earth. In their announcement they give with high precision the wave-lengths of the new interstellar lines and point out that their intensities as well as their wave-lengths are essentially identical with those of the titanium lines known from laboratory researches. They will now attempt to find a confirming titanium line at a still shorter wave-length.

In addition to the three sharp lines in the extreme ultra-violet that are almost certainly ascribable to ionized titanium gas, the two astronomers found two other ultra-violet spectral lines which they attribute to interstellar sodium. The presence of sodium and calcium in these spaces between stars has been known for many years, however. There still remain other interstellar lines found some years ago by Dr. Paul Merrill, of the Mount Wilson Observatory, which have not yet been identified. The spectra were made with a special ultra-violet spectrograph in connection with the hundred-inch telescope. This instrument makes use of a quartz prism, a special Schmidt camera, and a large plane grating of remarkable qualities recently made by Professor R. W. Wood, of the Johns Hopkins University.

WESLEY FULLER

## GLUTATHIONE OF THE THYMUS IN NORMAL AND CANCEROUS GROWTH



CASUALLY pulling rats out of his pockets like a magician instead of a scientist, Arthur Steinberg, of the Philadelphia Institute for Medical Research, just as casually made the first announcement of what may prove the major medical discovery of the decade in his demonstration in the Research Parade arranged by Science Service as part of the centennial celebration of the American Patent System.

Mr. Steinberg told his audience, after first amazing them with a demonstration of the precocious growth and development attained by rats treated with thymus gland extract, that glutathione, the chemical believed responsible for normal growth and for cancerous growth, is found in the thymus gland. The extract was prepared by Dr. A. M. Hanson, physician of Faribault, Minn. Its rôle in stimulating growth and development was demonstrated at the Philadelphia Institute for Medical Research under the direction of Dr. L. G. Rowntree. Discovery of the relation between the thymus gland and glutathione, seems to promise important new leads for solving problems of abnormal growth, even possibly including such abnormal growth as cancer.

Thymus glands from calves are known as sweetbreads. Aside from their use as a table delicacy, they had never attained importance until Dr. Hanson made his now famous extract and showed the gland's importance as a growth-promoting organ. Feeding this extract to white rats makes the next generation of rats develop much earlier and grow much larger than their parents. As each successive generation is fed the extract, growth and development is speeded up in the offspring at a truly amazing rate. In the tenth generation the rats matured in about one fifth the time it takes for a normal rat to mature.

The thymus gland plays its rôle of controlling growth and development in the young, it now appears, by means of the powerful chemical glutathione. This chemical can speed up cell division and thus influence both normal growth and the abnormal growth that is cancer. When chemical analysis of thymus gland extract showed that it contained glutathione, Dr. Rowntree and his associates started feeding the pure chemical to white rats, as they had fed the animals thymus extract. The results were the same as with the gland extract, only even more striking. Successive generations of rats whose parents were fed glutathione grew and developed at an even faster pace than the animals that had been fed the thymus gland extract.

Whether the gland manufactures this chemical, as the pancreas does insulin, or whether it merely is a storehouse for the chemical, Mr. Steinberg did not state. That and possible practical applications of the latest discovery must await further research.

## STERILIZATION LAWS

AMERICA has set an example to the world in her enactments of laws providing for eugenic sterilization, Dr.

Marie E. Kopp told physicians attending the symposium on sterilization held by the New York Academy of Medicine. The first statute in the world providing for sterilization of the unfit was enacted in Indiana in 1907, while the first European sterilization law was passed in 1928 in the Swiss Canton de Vaud. Since then similar laws have been passed in Denmark, Germany, Sweden, Norway and Finland.

Dr. Kopp, who was sent abroad by the Oberländer Foundation to study the European laws first-hand, said that in the Swiss Canton de Vaud in six years since enactment of legislation providing for eugenic sterility only 46 sterilization operations had been performed, while in Germany since January 1, 1934, when German law went into effect, 205 hereditary health courts have adjudicated more than two hundred thousand petitions for sterilization.

The great difference in these figures reflects some of the differences among the various laws as regards the scope of their compulsory features. Except in Germany, the European laws apply to persons who are technically "public charges." German legislation extends, however, to persons afflicted with certain hereditary diseases. "The European laws enacted to date emphasize the voluntary spirit with which it is desirable to have the petitioner make his application." Compulsory sterilization of public charges is, however, provided for in the laws.

Responsibility for deciding that a sterilization operation is necessary does not lie with the individual physician. Under the eugenic laws in Europe investigation is in charge of the Department of Public Health and decision in individual cases is made in the name of the commonwealth. Operations must be performed in approved hospitals by qualified specialists. The cost is borne by the institution normally charged with care of the defective individual.

## ITEMS

DROUGHT threatens to be an unwelcome visitor again in the Midwest and Northwest. Last week's crop-weather survey of the U. S. Weather Bureau shows severe lack of moisture in a wide sector from the upper Mississippi Valley to the Canadian border and the Pacific coast. Dust storms have raged in regions as widely separated as Iowa and Washington, severe wind erosion has occurred in Wyoming, and in Missouri, three consecutive weeks have passed without appreciable rain or snowfall.

IF the Siamese twin, Simplicio Godino, survives the operation which separated his body from that of his twin brother who died of pneumonia, he will be the fifth person in all medical history known to have survived such an operation. He may, in consequence, be more interesting as an unusual human type than he was as one half of a pair of Siamese twins. Dr. Alan F. Guttmacher, of the Johns Hopkins University, Baltimore, reported in a recent discussion of the subject that only four successful operations to separate Siamese twins have been reported in the history of medicine. All these operations were performed on children, the eldest being only twelve years old at the time of operation. The age of the Godino twins is given as 28 years. In the case of the 12-year-old twins, the "Radica-Doodica" Hindu sisters, the operation was performed in Paris in 1902 by the French surgeon, Doyen, in order to save Radica's life. Both these twins were gravely ill from tuberculosis. Doodica was almost dead before the operation and died shortly after. Radica survived and regained complete health. The two original Siamese twins, Chang and Eng, died within a few hours of each other. Chang had been sick and died first. The shock of awaking to find his brother dead is said to have killed Eng. Dr. Guttmacher commented on this that if a surgeon had been immediately available, an emergency operation would probably have saved Eng's life.

MODERNISTIC buildings of thirteenth century America, that looked as new to gaping Indian crowds as streamlined buildings look to us to-day, were described recently by H. E. D. Pollock, archeologist of the Carnegie Institution of Washington. Round buildings were new-fangled notions to Indians of Yucatan almost seven hundred years ago. Mr. Pollock, lecturing on Mayan Indian architecture, told of the unique circular tower at Chichen Itza, a great city-state of the Mayan Indians in Yucatan, which archeologists have partly restored. Round buildings of any sort continued to be rare among stately edifices of Mayan cities. Another new and exotic idea in thirteenth century America was to replace interior walls with rows of columns. This produced temples with great colonnades roofed by vaults or relatively light, flat ceilings. Indian invaders from Mexico influenced the Mayas in their architectural new era.

WHAT is believed to be the oldest musical instrument known to man has been discovered at ancient Tepe Gawra, Mesopotamia, according to Professor Millar Burrows, Yale Divinity School, president of the American Schools of Oriental Research. The instrument, part of a double pipe of bone, dates from the Chalcolithic Age, when man was shifting from the Stone Age to the Age of Bronze. Tepe Gawra, famed as the world's oldest known city, is being excavated by a joint expedition of the University of Pennsylvania Museum and the American Schools of Oriental Research, under direction of Professor E. A. Speiser, of the University of Pennsylvania. Another discovery from the Chalcolithic Age, of great importance to art history, is a large bowl decorated with red paint in panels showing sections of landscape, including mountains, rivers, animals and even a hunting scene. From a higher level of the mound at Tepe Gawra, about 3000 B.C., comes a carnelian bead of a kind characteristic of the ancient Indus Valley culture, one of the many illustrations of the commercial contacts between India and Mesopotamia in the early dynamic period. To determine the date of a remarkable round house discovered toward the end of the last season's campaign, the expedition is carrying the whole excavation down to a level previously reached in a small segment of the mound. When this has been done the lower levels will be investigated in order to establish the sequence of the ruins and of the prehistoric painted pottery.