OF INTEREST

ATOM SMASHING

Atom smashing will be of great interest not only to physicists, but also the medical profession, according to Dr. Robley D. Evans, 23, now on the M.I.T. teaching staff.

"Since artificial radioactive isotopes of all the stable chemical elements are now available," he explained, "the domain of the new technique, once thought to be of little or no value, has been opened to the investigation of all problems in all fields of science and technology in which accuracy would be useful."

"Ordinarily the method has approximately a million times the sensitivity of the best microchemical methods. It also has the tremendous and unique advantage of marking individual batches of any given chemical. For example, the thyroid gland normally contains a great deal of iodine, but if a subject is given an injection of one milligram of additional radioactive iodine, then the arrival of any given fraction of this injected radioactivity in the thyroid can be accurately determined without any interference from the overwhelmingly greater iodine already present in the gland before the experiment."

"This technique is opening a new and promising field of research and medicine. Already extensive investigations of the biochemical utilization of iodine in the formation of the hormones of the thyroid are being carried out in a co-operative project in which physicists and medical scientists are co-operating at the Massachusetts Institute of Technology."

NEWS NOTES

Development of the electron microscope has been one of the most important scientific advances of the past year. At the Institute, research on an instrument having a magnification of 7,000 diameters has been carried on by Hugh Bradner, under the direction of Professor William V. Houston.

As a giant natural memorial to the late Dr. George Ellery Hale, one of the founders of the Palomar Observatory, a Sierra Nevada mountain peak, more than 13,000 feet high and within three miles of Mt. Whitney, has been named in his honor.

Once again Dr. Irving F. Krick, the Institute's long range weather forecaster, has been named one of the 10 outstanding young men of the United States by the National College National Foundation. Winner of the Associated Press Women's Sportswriters Award, held at the Pasadena Athletic Club, last December, he has been honored by their election to fellowship in the Geological Society of America.

Federal soil conservation officials recently inspected the Institute's laboratories, and after watching demonstrations, expressed themselves as being tremendously impressed. Special interest was shown in the experimental flume, where study of the sediment carrying power of water is being conducted.

Stanley G. Stroud, veteran guard, was awarded the Wheaton Trophy as the feature of the annual Caltech Winter Athletic Banquet, held at the Pasadena Athletic Club. Senior, 4-year letterman, was named on the All-Conference team at the close of the past football season.

U.H.F. For Aeronautics

Use of ultra high frequency radio waves for airplane navigation is the newest contribution of science toward increasing the safety of aviation, Dr. William H. Pickering, assistant professor of electrical engineering at Caltech, informed a recent Sigma Xi Luncheon at the Athenaeum.

These ultra short waves, now coming into use, and with some phases progressing rapidly experimentally, are important to aviation because:

1. They virtually are free of static.
2. They provide a freedom from false courses.
3. They are not subject to defraction, such as the longer radio waves now in general use in flying.

The physical dimensions of the transmitters and antennas for ultra short wave broadcasting are such that, if practical from an aviation viewpoint, could be easily installed on a front lawn.

Dr. Pickering reviewed progress that has been made in the application of radio signals to the problem of blind landing, forecasting that many ingenious advances already have been made.

Electro-Photography

Patent attorney and inventor — this is the dual role of Chester F. Carlson, 30, following his recent admission to the bar. As an employee of a firm of patent attorneys in Manhattan, Carlson has aided in safeguarding the interests of many inventors. Now, as a patent attorney, he finds himself protecting his own interests as an inventor.

He has just been granted a patent for a new method of photography that has been widely acclaimed in scientific and industrial circles and may become an important factor in the nation's defense program. By Carlson's method of photography, an image is recorded electrically instead of chemically. It can be produced immediately with the same difficulty, which has in general been increased by the falling off of funds for educational purposes. During the past few years there has been a steady tendency toward increasing the tuition fees of privately endowed colleges and universities. The Institute has been reluctant to follow this trend, but it has become apparent that if the tuition fee were not increased, there would be the prospect of having to curtail some of the Institute's program of instruction and research.

Realizing that many of the students at present enrolled in the Institute have planned their educational financing on the basis of the present tuition charge of $300, the Board of Trustees ruled that students newly entering the Institute next September and after:

Institute authorities explained that the change was necessitated by the fact that the average rate of return on invested funds has been dropping steadily for the past several years. Privately endowed institutions all over the country have been faced with the same difficulty, which has in general been increased by the falling off of gifts of funds for educational purposes. During the past few years there has been a steady tendency toward increasing the tuition fees of privately endowed colleges and universities. The Institute has been reluctant to follow this trend, but it has become apparent that if the tuition fee were not increased, there would be the prospect of having to curtail some of the Institute's program of instruction and research. It should be pointed out that the fee of $360, which goes into effect for new students next fall, is considerably lower than the tuition rate which that student is now paying.

Realizing that many of the students at present enrolled in the Institute have planned their educational financing on the basis of the present tuition charge of $300, the Board of Trustees ruled that students newly entering the Institute can continue at this rate for one year. Privately endowed institutions are not subject to detraction.

The Trustees stated that it is not the Institute's intention to make a profit on the Student Houses. They were agreed, however, that the charges should equal the expenses: that the rate should be set experimentally, to be adjusted according to the need of the Institute. The Trustees have set the charge at $360, which includes a sum for upkeep, repairs, and the necessary replacement of furniture and other equipment. Experience has shown that $360 is not sufficient to provide for such expenses.

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Traffic Safety Device

What decidedly strikes the observer of American conditions, is the fact of an extraordinary permeation of daily life with the technic. There is hardly a field of the far reaching American civilization which does not have to thank the spirit of progressive technic for many improvements and perfections.

Singularly it affects the observer to be obliged to establish the fact at the same time, the simplest things and conditions are encompassed in these technical accomplishments; that, surprisingly, their practical developments have been overlooked. It is astounding, for example, that in the United States certain regulations for the control of automobile traffic have not been established, which, for instance have long been functioning in Central Europe, by virtue of official decree. These regulations lend to European automobile conveyance much greater safety than exists in the United States.

In different European countries, before any passenger automobile or truck is permitted to operate from the switchboard, and while there is no signal indicating anything to every driver when a left or right hand turn is to be made, or when a changeover from one lane to another is desired, as well as when one desires to go straight ahead. This apparatus always indicates clearly which direction is to be taken. There is no such apparatus in Europe, which is not equipped with such signal arms, which contribute to the safety of automobile travel. These are turned out serially by the automobile manufacturers and are delivered with the automobiles.

Such signal-arms, about 8-10 inches long, rest, when the automobile is following a straight line, in a slit or narrow groove, one of which is built in each side of the car. They are made of a metal frame, which is covered with red, transparent celluloid and in the interior is a red signal lamp which is attached. As soon as the driver wishes to change his course, he conveniently turns a switch lever on the switchboard, either to the right or left, corresponding to the right or left signal-arm attached. As soon as the fact that at night one is never sure of the direction of the car is recognized by such an unilluminated arm, so that by such misunderstanding a serious traffic accident may arise at any time, it is, certainly not comfortable in winter to drive with an open window and stretch one's arm out into the cold. There are, indeed, States in which, contrary to the climate of the Golden State or Florida, bad winter weather is had!). Furthermore, this practice leads to the habit of steering the car with both hands, while it should be made once in a while and hands rest on the steering wheel in order to insure the greatest traffic security. Also the non-illuminated signal-arms which are attached to the left side of American buses and trucks are very adequate with regard to a clear and unmistakable direction-indication and the recognition of the intent of the driver, since an automobile taking a right curve naturally attracts attention to its right side. It is, therefore, psychologically false to try to attract the attention of the following automobiles to the left side. It remains an undeniable fact that lighted, red signal-arms, attached to both sides of the automobile, unexpectedly fulfill their purpose while signals by means of the more or less careless raising of an unilluminated arm, or the turning of an unilluminated imitation-hand attached to the left side of the automobile remain very inadequate.

It is the hope of the writer that the above remarks may serve to interest authorities sufficiently to install or cause to be installed on both sides of mechanically operated red-illuminated signal-arms and to require their use by law and thus increase traffic safety. The long experience which the government of the European countries have with them prove that traffic safety can be greatly increased through their use.

Dr. Hugo Gabriel,
The Athenaeum.

NEW GENERATOR

Dr. C. W. Potapenko of the Institute's Physics Department last week announced development of a generator which can produce electric pulses of extremely short duration, down to nearly one-millionth of a second.

Dr. Potapenko not long ago produced the shortest radio waves ever achieved, one centimeter, with a strong radio tube no larger than a house fly.

Dr. Potapenko also determined that when bacteria in the human body are bombarded with ultra short magnetic waves, the heat is not and the waves which kill the bacteria.

T —

BEQUEST

A $1,000,000 trust fund to be eventually divided between Stanford, the University of California and California Institute of Technology was established under the will of the late Miss Lee L. Jacks, on file for probate at Monterey.

The will provides that income from the fund shall go to four surviving sisters of the pioneer family until death and then be shared equally between the three schools.

DEFENSE COURSES

All Alumni interested in taking some of the Institute's Engineering Defense Training Courses in Production Engineering, Tools Design, etc., should contact Professor Franklin Thomas at once. New courses will start about the middle of May. Courses are at night, and no tuition is charged.
PAULING RECEIVES MEDAL
(Continued from page 15)

"The Nature of the Chemical Bond."

"Pauling’s continual preoccupation with geometry has brought him into conflict with another geometer among chemists, Miss Dorothy Winch, and has resulted in several papers dealing with the structure of proteins."

A new structural chemistry has gone through the first stages of its development during the past twenty years, Dr. Pauling declared, describing two general methods of attack.

"The first," he said, "is the accurate experimental determination, by the analysis of band spectra and of X-ray and electron diffraction patterns, of the nuclear configurations of molecules and crystals. This has provided a great deal of information about the ways in which atoms are bonded together to produce substances with the great observed variety of chemical and physical properties.

"The second general method is the development of the theory of the chemical bond and the electronic structure of molecules and crystals, giving an insight into the detailed nature of the forces involved in interatomic interactions.

"After years of development the older structural chemistry has become so reliable that the organic chemist can usually write with confidence the structural formula of the substance produced by a given reaction. The new structural chemistry has not yet developed to this stage, but we may look forward to the time when the chemist can take the specifications of desired physical, chemical, or especially physiological properties, interpret them in terms of the constituent atoms, the interatomic distances and bond angles, and topological character of the structure, and deduce from these the nature of the molecule to be synthesized which will show these properties."

Dr. Pauling, who is now working on the problems of immunology in an effort to determine exactly the structure of antibodies and antitoxins, was born in Portland, Oregon, on February 28, 1901, and received the bachelor of science degree in 1922 from Oregon State College. He won a teaching fellowship at the California Institute of Technology and was awarded the Ph.D. degree by the Institute in 1925. He was a National Research Fellow in 1925-26, and in the latter year was awarded a Guggenheim Fellowship, which was renewed in 1927. He studied with Professor Arnold Sommerfeld in Munich, with Niels Bohr in Copenhagen, and with Erwin Schroedinger in Zurich.

Dr. Pauling became assistant professor at California Institute of Technology in 1927, associate professor in 1929, professor in 1931, and chairman of the division and director of the Gates and Crellin Laboratories of Chemistry at the Institute in 1937. He lectured in chemistry and physics at the University of California each Spring from 1929 to 1933, and at the Massachusetts Institute of Technology in 1932. He was George Fisher Baker Non-Resident Lecturer in Chemistry at Cornell University in 1937-38.