SCIENCE NEWS

Science Service, Washington, D. C.

PHARMACEUTICAL RESEARCH

NEVER in the history of the world have the possibilities of adding to the list of valuable drugs been so great as at the present time, according to a statement made by Dr. Reid Hunt, professor of pharmacology at the Harvard Medical School, and president of the United States Pharmacopoeial Convention, at the opening session of the convention's decennial meeting in Washington.

We may yet get more drugs from the plant and animal kingdoms. There is no limit to the number that the chemist and the pharmacologist may synthesize in their laboratories. But even more important is the possibility that new and important uses may be found for drugs which we already have.

Some of the saddest pages in the history of mankind have written on them the failure of physicians to see the possibilities for treating disease with well-known chemicals. Ether was known to doctors and chemists for nearly 300 years before it was used as an anesthetic, Dr. Hunt pointed out. Another drug, amyl nitrate, a few drops of which relieve the frightful agony of one form of heart disease, was well known to chemists for twenty-three years before it was used to treat this condition. The same delayed application was repeated in the case of other anesthetics and many other drugs. They were well known chemically for years before any one tried them in the treatment of disease and for the relief of pain. "To-day," said Dr. Hunt, "relief may be obtained anywhere in the world for a few cents, which fifty years ago was beyond the reach of any potentate or Croesus."

Research is needed to investigate the medical possibilities of the 258,000 organic compounds which chemists have already carefully described chemically and physically. New compounds are being added to the list at the rate of about twenty a day. Dr. Hunt stated that America's facilities for studying the medical applications of these new compounds are very inadequate compared with research activity in Germany and other European countries.

THE STANDARDIZATION OF ERGOT

A NEW chemical method of standardizing a drug widely used in childbirth may be the means of saving countless lives of mothers and babies. The drug is ergot. The new method of standardizing it, which is a chemical, colorimetric method, was devised by Dr. M. I. Smith, of the U. S. Hygienic Laboratory, who reported it at the meeting of the American Pharmaceutical Association.

The method requires much less experience, less time, less trouble, and is more accurate than the physiological method which is given as the standard by the present U. S. Pharmacopoeia, which is the legal standard for drugs and medicines.

Dr. Smith believes that a biological method of standardizing ergot, developed by Professor Clark, of the University of Edinburgh, is better than that given in the U. S. Pharmacopoeia. His new chemical method agrees well with this English one.

Ergot is a complex drug containing many chemical substances, among them alkaloids. It is the alkaloids which are important, but not all of them are physiologically active. Chemical methods of determining the alkaloids were described many years ago, but Dr. Smith's method is the first to determine quantitatively the physiologically active alkaloids of ergot.

Some 40 samples of fluid extract of ergot were examined by his method, of which ten were commercial extracts ready for the market. These varied in potency as much as 500 per cent., the strongest being five times as strong as the weakest.

This difference may be very serious when the drug is given to a mother in childbirth. The dose given is for ergot of a standard strength, but the physician has no way of telling whether the ergot is standard or not and must rely on the label on the container.

Manufacturers can not come up to the U. S. Pharmacopoeia standards chiefly because they have not a good method of standardizing the drug. Dr. Smith believes that his method gives them the means of producing uniformly standard ergot.

MICROSCOPIC MOVIES

MOVIES showing microscopic cells 3,000 times larger than they actually are and bringing out slight variations in shade which are unnoticed by the naked eye looking through a microscope have been taken at the Rockefeller Institute of New York, Dr. Heinz Rosenberger reported recently to the Society of Motion Picture Engineers.

Dr. Rosenberger said that during the past few years scientists have been able to increase more than ten times the magnifying power to which movies can be applied. Among the interesting discoveries made by these pictures is an undulating membrane surrounding white blood cells which is much larger than the cells themselves.

This membrane was invisible to the naked eye making examinations through ordinary microscopes, but it was brought out by the photo emulsion which often reveals differences in shades too fine to be detected by the eye. Dr. Rosenberger pointed out that the usual stains used to outline cells can not be employed with the camera. When subject to the great light necessary in taking the pictures the stains cause the cells to act abnormally and to die fast.

"Difficulties of high magnification photography increase rapidly by arithmetical progression," Dr. Rosenberger said. "Suppose we are looking at the moon through a telescope. When it is a low-powered telescope the moon will move slowly across the field of vision, due to the rotation of the earth. With medium-power telescopes the moon will apparently move very much faster across the field, while with high-powered telescopes one can hardly follow its rotation."

The same applies to microscopes, it was explained. As

magnifying power increases the objects apparently move faster and make necessary more frequent exposures. When exposures must be made more often the time of exposure is decreased and the intensity of light required is increased. More light means that the delicate objects being photographed will be more readily injured. Difficulty of holding the focus and reducing vibration effect is also increased with high magnification.

LOCUSTS IN EASTERN EUROPE

THE locust plague that has appeared clear across northern Africa, from Egypt to Gibraltar, and has extended into the Near East and the Balkan countries, is a distinct menace to the great wheat areas of eastern Europe but is not likely to make trouble in the countries with which American travelers are most familiar.

This is the opinion of entomologists of the U. S. Department of Agriculture, as given to *Science Service*. Locusts are more or less chronic in what might be called the drier cereal areas all over the world. The wheat and barley lands of northern Africa, Palestine, Asia Minor, Mesopotamia and all the Black Sea basin both in Europe and in Asia have to contend with them every year. But some years are much worse than others, and the present outbreak may indicate 1930 as one of the bad ones.

The presence of swarms of the insects in Roumania is the first hint of big trouble, for Roumania is a major wheat country. If the locusts spread farther and reach Ukraine and other parts of Russia, which are comparable with the western United States and Canada as wheat regions, the results might be disastrous. There have been no indications as yet of locusts in Russia, but the real crisis will come a little later, when warm weather sets in.

The old-world locust is a large, long-winged grasshopper that flies in swarms so vast as to darken the sun. When such a swarm settles on a field or orchard it often wipes out every trace of green leaf and stem in fifteen minutes or less. The devastation they can cause, and the terror they bring, have never been told more graphically than by the writer of the Book of Exodus, in Chapter 10, Verses 12 to 20. "There remained not any green thing in the trees, or in the herbs of the fields" has been written many times since, and of many other lands besides Egypt.

The locusts of Europe, Asia and northern Africa are all members of one species, usually called the Moroccan locust. There is a short-winged locust, but it is considered by most entomologists to be simply a form or life-phase of the long-winged locust. During part of its life the swarm will travel by hopping or very short flight along the ground. In this stage it can be fought by poisoned baits, by trenching and by various other mechanical and chemical means. But when the insects have grown their long wings and taken to the air, no method so far devised can avail to stop them.

LOCATION OF EARTHQUAKES BY SEISMOGRAPHS

CABLE dispatches from Teheran, telling belatedly of a serious earthquake that killed 2,000 persons and caused wide-spread damage in the vicinity of Urumiya (Urumiah) Lake in northern Persia, were anticipated by *Science Service's* announcement of the earthquake. The location of this disaster was determined a few hours after its occurrence through analysis of the telegraphed records of seismographs located in the United States, the Philippines, China and Canada.

The earthquake occurred Tuesday, May 6, at 5:34 P. M., Eastern Standard Time, and sent its vibrations to all parts of the world. Within a few hours seismological observatories cooperating with *Science Service* had telegraphed, radioed or cabled their records. Experts of the U. S. Coast and Geodetic Survey utilized the data in locating the epicenter or place about which the earthquake centered.

Two days before interrupted communication brought direct cable news, on Wednesday morning, *Science Service* announced to newspapers: "A violent earthquake occurred in northern Persia late yesterday. It is probable that many were killed and much damage was done."

Information from the region of the earthquake shows that the Persian disturbance is probably as serious as the Burma shock of May 5 about which more information has come to America.

According to the United Press dispatch the shock was most severe in an area west of the southern end of the Caspian Sea, some 400 miles northwestward of Teheran. The inhabitants are mostly Armenians.

When the earth shakes severely, vibrations from the center of motion travel to all parts of the earth. They go in two principal ways, one through the center of the earth, the other along the surface. It is this fact that makes possible the determination of the quake's distance. The internal wave travels faster than the surface wave, and so is felt by distant seismograph stations first.

The seismograph, the instrument with which earthquakes are detected, consists essentially of a pendulum arranged to swing on the slightest motion of the earth under it. Greatly amplified, the motion is recorded on a moving strip of paper as a wavy line. Every minute a clock also makes a mark on the paper so that the exact time of a record can be obtained.

When an earthquake is not occurring, the line is straight. Then, as the first wave of a quake reaches the instrument, it starts to wave. A few minutes later, unless the quake is very close, another series of waves appear. These are the result of the vibration that traveled along the earth's surface.

Seismologists have studied many earthquakes and as a result they have compiled tables from which the distance of a quake from a seismograph can be determined from the difference in time of arrival of the two waves.

The record of a single station can only locate the earthquake on a circle at a certain distance from the station. Sometimes this circle may cross a region where earthquakes are frequent and then it would seem probable that the quake occurred there. However, when reports are received from several stations, circles can be swung on a globe around each of them. Where they intersect is the exact location of the quake.

By such a procedure *Science Service,* with the cooperation of the U. S. Coast and Geodetic Survey and Jesuit Seismological Association and telegraphic reports from some 30 seismological stations throughout the world, locates many earthquakes.

SMITHSONIAN EXPEDITIONS TO ALASKA

Two scientific expeditions are setting out from the Smithsonian Institution for Alaska, to seek clues to the origin of the Eskimos and to pursue the quest for the mysterious first American immigrants.

Dr. Aleš Hrdlička, who has measured and studied thousands of Eskimos, both living and prehistoric types, is *en route* to the Kuskokwin River in southwestern Alaska. He hopes to fill in missing links in his chain of evidence as to what the relation may have been between the Eskimos and other American tribes, and how they link with the Asiatic tribes.

The second expedition about to depart is conducted by Henry B. Collins, Jr., archeologist at the Smithsonian, accompanied by James A. Ford, of the Mississippi Department of Archives and History. This expedition is heading for St. Lawrence Island in the Bering Strait, where it will explore four ancient Eskimo villages a thousand years old or older.

"Until very recently it was not realized that the prehistoric Eskimos of Alaska were artistic and ambitious craft workers, far surpassing any modern Eskimos in their attainments," Mr. Collins said in outlining his plans. "St. Lawrence Island was a strategic center of this rare, lost culture of the Arctic. Two previous years of digging have revealed three stages of Eskimo life, showing that the artistic taste and the energy of the oldest known Eskimos eventually dwindled and degenerated.

"This year we hope to dig through the frozen soil into unprobed levels and so find out what led up to the Eskimo golden age."

The possibility of finding traces of far more ancient men, that is, some of the original immigrants who found their way from Asia into America, is another hope that spurs on the efforts of excavators in this Bering Strait region. Even if the earliest men entered America in inter-glacial times, when there was a land bridge across to Alaska, all the clues of their passage might not be lost, for the islands and shores remaining above water might still hold some of their tools or their bones, Mr. Collins believes.

ITEMS

THE 69-inch mirror of the new Perkins Observatory telescope has reached the polishing stage at Pittsburgh and is now having its surface given its final shape. It is the largest piece of optical glass made in the United States and when completed will be placed in service at Ohio Wesleyan University, Delaware. It will then be the third largest reflecting telescope in the world.

UNTIL its tranquillity was broken by the severe earthquakes of May 5 and 6 in Burma and Persia, the crust of the earth had been singularly free from severe disturbances since the Aleutian Islands world-shaking shock of December 17 of last year. This period of nearly six months of comparative freedom from earthquakes is unequalled in the recent annals of seismology. When earthquake experts gathered in Washington for meetings a few days ago it was a topic of conversation. A local shock in Imperial Valley, California, the first week in March, and a larger earthquake centered in the Banda Sea, between the islands of Borneo and New Guinea, on March 26, were the only earthquakes on record in the quiet period.

A RESEARCH radio station isolated in the middle of a 200-acre farm is provided for in a bill introduced by Representative R. N. Elliott, of Indiana, which has passed the House. It is necessary for experimental purposes to get as far as possible from buildings and electrical disturbances. The new radio laboratory would be located near the District of Columbia and run by the U. S. Bureau of Standards. It would be established at a cost of $147,000.

PROOF that there is a possibility of two plants being produced from a single seed has been obtained at the botanical laboratory of the University of Southern California, where Mrs. Tema Shults Clare, a teaching fellow, obtained in two instances pairs of twin seedlings sprouting from Torrey pine seeds, and one pair of similar twins from the seed of a pinon pine. Further examination of seeds showed that this condition is possible in at least a small percentage of pine seeds. One pinion pine seed contained the beginning of six little plants, four of which had developed to a point indicating that they might have grown if the seed had been planted. Mrs. Clare's work is supported by earlier investigators who, although they did not sprout twin seedlings, at least observed potential twins in seeds which they dissected. This habit of twinning from single seeds is peculiar to the gymnosperms, the great division of the seed plants to which pines and other evergreens belong. The higher seed plants, the producers of showy flowers, apparently do not have this possibility.

SUNFLOWER plants that have a warm place in the sun have nearly four times as many calories per plant as plants grown in the shade with other conditions exactly the same. This is one of the interesting facts about energy content of plants discovered by Dr. Frances L. Long, of the Coastal Laboratory of the Carnegie Institution of Washington at Carmel, California, in investigations that utilized the oxygen bomb calorimeter, an apparatus most frequently used to determine the energy value of fuel. Dr. Long used the heat of combustion as determined in the calorimeter rather than chemical analysis and subsequent calculations of caloric values. The energy in seeds was also determined. Castor bean seeds contain 2,975 calories, or 20 times as much as oat seeds. The calories in seeds represent all of the sun energy stored during the previous year and not used by the plant in its growth. They are the energy passed on as food for the sustenance of the new seedling of the next year.