Of the 96 cases of complete industrial scalping, 95 were women and one was a man, a Chinese whose queue was caught in machinery. The youngest of these scalped persons was eight years old, the eldest 63 years.

American Indians, Dr. Cahill said, were not the only ones to practice scalping. It was a regular act of war even in the days of the ancient Greeks. It did not get into the medical literature to any extent, however, until the introduction of manufacturing machinery in the nineteenth century. It now goes by the medical name of accidental avulsion of the scalp, instead of the old term, scalping.

Refrigeration for Cancer

"Refrigeration" of the body to a state of "semi-hibernation" is the new method of cancer treatment now being tried at Temple University School of Medicine, Drs. Temple Fay and George C. Henny of that institution reported.

The "refrigerating is done by special cooling devices applied to cancer areas, or by X-ray treatment of pituitary, thyroid and sex glands. The latter method reduces the entire body temperature. Object of the refrigerating is to induce a temperature unfavorable for the growth of young cancer cells, which apparently require the high temperatures found in the mouth and internal organs.

In cases in which the method was used to lower the temperature of the area of cancer growth, there was "definite retardation in the growth and decrease in its size in some instances," the Philadelphia doctors reported.

The X-ray "refrigeration" method is used in cancer cases where the tumor cells are widespread throughout the body. Reporting on this method, the doctors stated:

"In one instance, the tumor cells in the brain, spine and bones of the body disappeared and have shown no signs of return, during the past nine months. In two others, definite improvement has been noted in the size of the tumor masses."

The cases had all been given up as hopeless after all regular methods of treatment had failed. Whether the improvement will be permanent cannot be stated at present, but the method is of importance because it gives new approach to the cancer problem.

Important also is the fact that pain was promptly relieved following "refrigeration" of the area of cancer involvement. This alone helped to maintain the patient's strength and morale without the need of narcotics.

Research which led to this new method was financed by the International Cancer Research Foundation.

Key in Heredity

Cancer occurs because cells of the body which were never meant to be parents of new cells suddenly begin to have large numbers of offspring. The reason they do this is because of a change in their hereditary make-up.

This is the explanation, reduced to very simple terms, which Dr. J. P. Lockhart-Mummery of London presented to the meeting as his theory of the cause of cancer.

The theory, as Dr. Lockhart-Mummery pointed out, does not seem to help solve the problem of how to prevent or cure cancer. But in the past when the cause of a disease was discovered it generally led to discovery of some means of prevention or cure. The same may prove to be true in the case of cancer.

At all events, the key to the problem of what causes cancer has been found, he believes, in the science of genetics, which has to do with the way characteristics are inherited.

Scientists recognize two kinds of cells in the body: germ cells, which have nothing to do with disease germs but are the cells that are involved in reproduction and carry hereditary characteristics from one generation to the next; and somatic cells which do not have numerous progeny. When a somatic cell dies it is replaced by another single cell.

Sometimes, apparently, the hereditary factors called genes get mixed. Genes are better known as carriers of traits such as the color of eyes or the shape of noses. They also carry all the other features which make a particular individual—either a person or the innumerable tiny cells which make up his body —one sort of person or cell instead of another. When cancer develops, according to Dr. Lockhart-Mummery's theory, it is because there was a biologic change in the genes of somatic cells which endowed them with the power of having offspring. This change is called a mutation and is not reversible.

Experimental proof for this theory cannot be given at present, Dr. Lockhart-Mummery said, because genes "are and always must remain invisible to the human eye and gene mutation cannot ever be visible." His theory rests instead on the way it explains logically the known facts and fits in with other findings, such as those of Dr. Maud Slye on the genetic factors in mouse cancers.

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AVIATION

New Type Airway Markers Being Installed by Bureau

SPURRED by approaching winter, and congested air traffic, the Bureau of Air Commerce is rushing installation of added radio safeguards for commercial planes.

Specimens of two new types of markers, designed to replace in time the "cone of silence" which marks radio stations, are undergoing tests now. One hundred airport markers in all are to be installed this winter.

Airports are at present identified by a "cone of silence" above the airport radio station, which is usually located near the airport, but not at it. The beam sent out cannot be picked up by a plane immediately over the station, giving rise to the so-called "cone of silence" which has served to mark the station. Pilots have in the past criticized the "cone of silence" and have asked for a supplementary "positive signal."

The new station marker is a high frequency radio transmitter sending a narrow beam of waves directly upward from the station. It lights a lamp in the cockpit.

Twenty fan-type markers, which send an interrupted signal directly upward, are being installed at points twenty to thirty miles away from airports to mark for the plane pilot a point at which he must call in to the airport to determine whether he has a clear path into the landing field.

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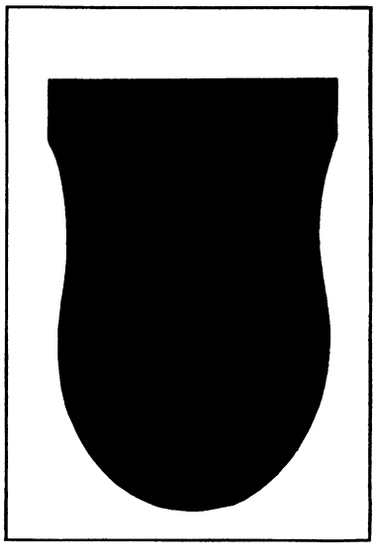
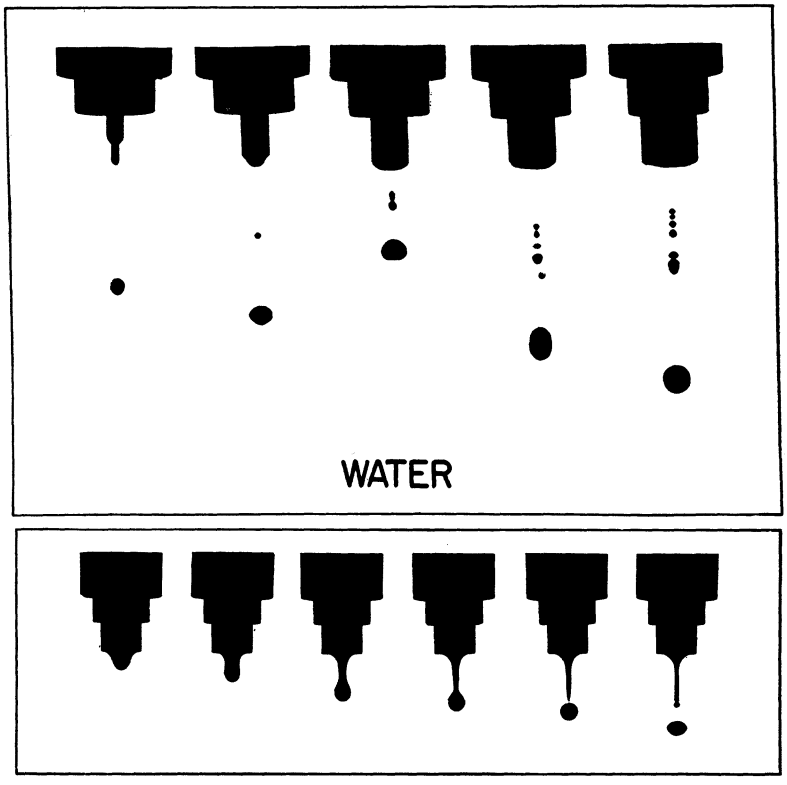


DROPPING

This one was caught just as it fell from the nozzle.



CAMERA! LIGHTS! ACTION!

And these various water drops and their anatomy are recorded for the scientists to study. Drops of different sizes behave differently, the larger ones forming "necks" which break up into secondary drops as shown in upper view. Successive stages of the formation of a drop are shown in lower picture; notice the neck forming behind the drop. Because this drop is small, the neck does not break up, but forms the nucleus for a new drop. These pictures were taken directly toward the very bright spark used for illumination and so appear in perfect silhouette; a difficult attainment.

PHOTOGRAPHY—PHYSICS

Water Drops Pose for Photos From MIT High Speed Camera

New Field of Knowledge of Surface Tension of Liquids Opened By Use of Pictures Snapped 800 to the Second

NOT ALL the crack motion picture cameras or all the first-class cameramen are in the possession of Hollywood. Nor are the only important motion pictures a product of the nation's film capital.

Up at the Massachusetts Institute of Technology at Cambridge, Mass., there's a motion picture camera the like of which Hollywood has never before seen; a trio of photographers who are not members of the American Screen Cameramen's Guild; a story whose scenario is not the product of the frenzied Movie City's wordshops; and which will not be shown as one end of a double-feature program.

The camera is a costly machine that takes 800 photographs a second. Photographers are Prof. E. A. Hauser, and Drs. H. E. Edgerton and W. B. Tucker.

The story is the answer to the question, "What makes a drop of water?"

Making 800 silhouetted photographs of a drop of water growing at the end of a tiny tube and finally breaking off to fall with a soft *plash,* the three Massachusetts scientists are probing deeply into the mechanics of dripping water. They are showing exactly how that drop of water that drips off the faucet forms. and why a drop of water tends to become a sphere when given half a chance.

From their pioneering work in this field of colloidal chemistry, the chemistry of particles that are bigger than nature's building blocks, molecules, but smaller than the smallest visible thing, may well come in the not-too-distant future discoveries ranging from how to make better shaving cream to better lubricating oil and grease for the world's wheels.

Applications Follow

No thought of immediate practical application is in the minds of the three scientists, but so it has always been—the pure scientist pushing out in search of knowledge; the applied scientist following a short time later with discoveries on which totally new ways of living may be based.

Water drops tend toward a sort of "best size," they found. When water was dripped from brass tubes the diameter of which was less than half a centimeter (about a fifth of an inch), the hanging drop was larger than the diameter of the tube. When the tube was made larger, the size of the drop was smaller than the diameter of the tube.

Small drops are clean drops, that is, they come off cleanly, one at a time. But large drops have a "neck" between the drop and the end of the tube. And the larger the tube and drop, the more pieces the neck breaks into in falling.

Next time Mr. and Mrs. America have to put some eye drops in their eyes, they would do well to remember this fact uncovered by one of the world's fastest cameras. Make sure the dropper has a small tip; and when you count off six drops it will be exactly six drops without any in-between dripping that may mount up.

Studies of surface tension were what the three men had in mind when they set up their special instruments. Surface tension is the tension along the surface of a liquid that tends to make it pull itself together and assume a shape with as small an area as possible. Drops are round because of that; the shape with the greatest volume and the least area is the sphere.

This tendency to contract its surface makes water rise through tiny capillary tubes; makes it spread through the towel when only one end has been wet; colors the whole cube of sugar brown when one corner has been dipped into the coffee. Surface tension makes a mixture of soap and water or oil and water assume a frothy, bubbly form that

in everyday life is called lather. On the lather depends the cleansing quality of soap.

It has long been known that dissolving various substances in water changes its surface tension. It has also been known in a relatively vague way what changes took place when particular amounts of a substance were added. But Prof. Hauser and his associates, by examining with their camera the shapes and sizes of drops of these liquids have found out definite things about surface tension.

A viscous or thick liquid, such as the grease that goes into an automobile's springs, doesn't behave at all like a liquid, they discovered. Such liquids have a marked ability to form threads. Their photographs showed that when glycerine, a liquid used among other things as an anti-freeze, drops from the end of a tube, a tough neck was formed and that many drops "remained joined by practically invisible threads."

Cautiously they say that the ability of viscous liquids to form threads may throw new light on the actual nature of viscosity—an important matter in a world that uses immense quantities of lubricants. From earlier knowledge of how lubricants work has come better and cheaper lubricants; from further study of the new results will come something even better.

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PUBLIC HEALTH

School Pupils Shock Troops In Battle Against Malaria

Thousands of Youngsters 6 to 12 Will Each Give a Drop of Blood To Aid in Mapping Areas of Disease

FOUR score warriors in the fight against disease are going forth this fall to do battle against an old, as yet unconquered foe, malaria—the chills and fever plague. And they will be led in battle by hundreds of thousands of little children.

In case you think this old disease enemy has lost its grip, consider the estimates of a national authority on the subject, Dr. Louis L. Williams, Jr., of the U. S. Public Health Service. Dr. Williams believes that there were 4,000,000 cases of malaria last summer. That is ten times as many as the annual number of cancer cases, nearly 600 times the number of smallpox cases reported annually.

Dr. Williams made it clear that his figure is only an estimate. Malaria cases are not reported with any degree of accuracy—hardly reported at all, in fact. That is one of the things the four score malaria fighters are going to battle. Without knowing how many malaria cases exist, it is hard to lay plans for wiping it out.

Mosquito Carries Malaria

Malaria is caused by a germ called a plasmodium which, as many a school child now knows, is carried by a particular kind of mosquito. The malaria plasmodium, and there are three different kinds of these germs, must spend part of their lives in the mosquito's body and part in man's body. The mosquito sucks them up with the blood when she bites a malaria patient or carrier and later transfers them to another victim of her bite.

Knowing this much and knowing the habits of the malaria mosquito, you would think that the disease could be brought under control, practically eradicated. Scientists think so too, but they have been hampered in putting their knowledge to work, chiefly by lack of funds and partly by lack of a unified plan of attack.

Social Security money made available to state health departments from the federal government is now helping out on the financial angle. The plan of attack has been drawn by health authorities of the federal government and of 13 southern states — Missouri, Tennessee, Oklahoma, Kentucky, Arkansas, Mississippi, New Mexico, Alabama, Florida, Georgia, South Carolina, North Carolina and Louisiana. These are the states where most malaria is found in this country. Texas also has a malaria problem, but has already started its own campaign along the same lines as the other states have just adopted.

First step was the training of captains and their aides for the fight. This

THE TEST

First the finger is cleaned thoroughly with alcohol-dipped gauze. Next the doctor sticks the finger with a long needle sharp enough so that it doesn't hurt. Third, the microscope slide is brought down to the drop of blood so that the surface just touches the top and so that it does not touch the skin.