DERMATOLOGY

"Housewives' Hands"

Structure of keratin, a fibrous protein forming the skin's outer layer, is changed when exposed to solutions of 15 randomly selected detergents.

➤ THE SKIN inflammation known as "housewives' hands" is due to damage to the keratin of the skin, scientists at the University of Pennsylvania have discovered.

Keratin is a fibrous protein whose meshwork forms the predominant part of the outer, horny layer of the skin.

The finding was made through a method of determining the effects of soaps and detergents said to be more accurate than any previously known method. It was developed by Dr. Eugene J. Van Scott of the university and Dr. J. B. Lyon, a visiting scientist from Westminster Hospital, London, England.

Doctors are seeing more cases of "housewives' hands" and kindred skin irritations these days, and at the same time production of new soaps, powders and other detergents for cleansing has increased. Concern over this situation has led manufacturers to join with scientists in seeking new information on the matter.

The University of Pennsylvania scientists, under the direction of Dr. Donald M. Pillsbury, picked at random 15 of the leading detergents to be found in any average market place. These were tested to see whether they could cause any changes in human skin. Changes were found in the structure of the keratin molecule under the action of solutions of the 15 detergents.

The keratin molecule is something like a rope ladder with parallel sides and cross connecting rungs. Between the intact rungs of this figurative ladder are other chemical units called sulfhydryl groups. They are made of sulfur and hydrogen.

Most of the 15 detergents tested caused sulfhydryl groups to appear in much greater than normal numbers in the keratin. All of the detergents had some effect, but about half of them, the scientists report, should be well tolerated by normal skin if reasonable precautions are taken to avoid prolonged exposure.

The natural oils of the skin protect the keratin a little against the effects of several of the detergents tested.

Those who must use soaps and detergents excessively, the scientists advise, should apply a proper protective to the hands before, and thoroughly rinse the skin afterwards. If this does not give enough protection, rubber gloves should be worn.

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ENGINEERING

Stereophonic Sound

➤ A NEW process is in the works for recording stereophonic sound on magnetic strips, then attaching the strips to professional movie film like decals.

Dr. Wilfred W. Wetzel, technical director of Minnesota Mining and Manufacturing Company's magnetic products division, told SCIENCE SERVICE that the process some day also may be used to add magnetic sound tracks to home movies.

Dr. Wetzel, who received the 1953 Samuel L. Warner Memorial Award for his work in motion picture sound engineering, said the new magnetic sound tracks use a special high-output magnetic oxide that yields the same quality of sound but requires far less space on the film than present optical sound tracks. This permits stereophonic sound recorded on three sound tracks and one control track to be substituted for the single sound track now widely used.

Advantages of the new system lie in the uniform magnetic coatings, the ease of their application to film, and their higher sound output. Unskilled workers can slip the sound tracks onto the film.

Billed as an added attraction to some third-dimensional movies, stereophonic sound largely has been reproduced so far from a separate, extra-wide strip of magnetic tape. This tape is run on a special play-back machine that must be carefully held in step with the movie projector. But synchronizing problems are avoided by the new sound-on-film process.

Each of the new decal-like sound tracks occupies a strip only 60 one-thousandths of an inch wide on the film. The present optical sound track on most films requires a strip 200 one-thousandths of an inch wide.

Dr. Wetzel said the actual make-up of the new recording material is still classified as a trade secret. However, he said his company has been developing it for two years.

A new playback head is being developed for the tape sound tracks on motion picture film that is said to last "10 to 10,000 times longer" than those currently in use.

Dr. Wetzel said that the playback head now being investigated consists of a "ferrite core" which already has played back film sound tracks for 2,000 hours with no perceptible wear.

He described the ferrite core as a ceramic material having magnetic properties. It is being developed to replace the mu-metal, an iron-nickel alloy, normally used in tape playback heads.

Dr. Wetzel, who created the first practical plastic-coated magnetic tape, said playback heads now in service in theaters last only about 300 hours, and that it costs nearly $500 to replace them. This figure includes the service man's expenses.

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MARINE BIOLOGY

Underwater Murkiness Removed by Filtering

➤ THE MURKINESS that keeps divers and underwater cameras from seeing very far or very clearly nearly disappears if the water is filtered.

This is true at least in the Chesapeake Bay, Dr. Wayne V. Burt, until recently of the Chesapeake Bay Institute, Annapolis, Md., reports in *Science* (Oct. 2). Small particles of matter that can easily be filtered out, he has found, are the main limiting factor on underwater visibility, although some scientists have believed that coloring matter dissolved in the water was the reason for limited seeing.

The U. S. Navy supported Dr. Burt's research, part of a general study to learn the depth of light penetration and the reasons for light scattering under water. The minute plant and animal life on which fish feed are found only in the layers to which light penetrates. Thus how deep the light goes controls the food supply, and, therefore, the fish supply.

In samples of river water, the particles that could be filtered off, Dr. Burt found, were four times better at cutting down the distance light would penetrate than material that passed through the filter.

Science News Letter, October 17, 1953

ELECTRONICS

Pint-Sized Radar Serves Small Boats

➤ THE MAGIC eye of radar, which can see through fog and darkness, has been adapted to serve the smaller vessels that cram into crowded harbors or sail through treacherous waters.

Particularly designed for tugs, yachts, motor launches and small fishing vessels, the new Raytheon radar can peer ahead 16 miles, plotting the picture of obstacles on a television-like tube. "Echoes" from ships, buoys and land show up as "pips," or masses of light that are interpreted by the user.

A special transparent screen fits over the scope and can be marked upon with a grease pencil. This permits the navigator to keep track of the position of moving ships, to chart their direction and speed relative to his own vessel to avoid collisions.

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