

ing agent amounts to seven percent of the wild plant. It was once cultivated in South America in the hope of finding a market, but although it is plentiful the cost of harvesting keeps it from competing with saccharin and other synthetic sweeteners.

Now the cyclic component attached to the sugar-like stevioside offers hope that the plant may become a raw material for cortisone-like compounds. Chemically, stevioside is interesting as the only sweetening substance of any power that contains no nitrogen. No chemical structure common to sweetening materials has been discovered.

Inks Need Stickiness

► **WHAT** makes things stick together, especially things like paint, plastics and printing ink?

Printing ink especially should stick to the surface it is printed on. Its ability to do so is affected by conditions for its solid rupture vs. those for its viscous flow, stated Dr. A. C. Zettlemoyer and his associates of the National Printing Ink Research Institute at Lehigh University, Bethlehem, Pa.

High speed photography helped these scientists learn about these conditions and how they are affected by added pigments and other factors.

Adhesives for bonding two pieces of glass together are best made of polyvinyl-butylal resin mixed with modified phenol, Dr. Frank Moser of the Pittsburgh Plate Glass Company told the meeting. Other new types of adhesives for glass were listed by him, including epoxy resins.

Dr. E. W. McGuiness of the General Electric Company praised epoxy resins for stability at the boiling point of water, naming many catalysts which improve these new resins.

Science News Letter, April 16, 1955

TECHNOLOGY

Milk Vending Machines Possible With New Pump

► **VENDING MACHINES** dispensing milk into paper cups like soda pop may soon be popping up in theater lobbies and office corridors.

A splash-proof pump has been developed at the Armour Research Foundation of the Illinois Institute of Technology, Chicago, that meets with "strict health requirements that milk dispensed from a machine must not splash or touch moving parts."

The new pump is described as the first device ever perfected to meter and pump a liquid continuously without splashing and without the use of a pressurized tank. In operation, the milk remains inside rubber tubing connected to a milk tank. The milk is trapped in the tubing between two rollers.

In ordinary pumps, the Armour scientists said, splashing is prevented by reducing the pulsation, much like the action of the shock absorber on a car. In the new pump, an especially-designed cam that lifts each roller completely eliminates the pulsation.

Science News Letter, April 16, 1955

GENERAL SCIENCE

Study Lighthouse Horizon

► **AFTER WATCHING** over the Sandy Hook, N. J., horizon for 93 years, the historic Navesink Lighthouse has been retired. But not until scientists had spent nine months in its tower taking nearly 3,000 pictures of that horizon.

Lenses were focused on that thin, sometimes imperceptible line between sea and sky to perfect techniques of shooting the boundary as an air-navigation aid.

If photographed accurately enough, the horizon could provide a reference line to determine pitch and roll of aircraft. The accuracy called for in the experiments allowed an error in angle of roll not greater than 1/240th of a degree.

The scientists, from the research division of the New York University College of Engineering, are now studying the slides to find the best combination of film, filter and exposure to record the horizon from an airplane. The results will be turned over to the Sperry Gyroscope Co., which sponsored the research.

Flight tests are scheduled to try out the system which is expected to help check aircraft stability.

The NYU researchers report that water vapor in the air was the greatest single obstacle to clear horizon shots. To increase contrast, they experimented with sky-colored filters.

Smoke from industrial areas of New York, New Jersey and Philadelphia hampered the photographic work considerably, they said. But it also provided a screen that might well be encountered by aircraft in flight.

The group began taking pictures with a standard 35mm camera and later used a 400mm long range lens.



SHOOTING HORIZON—NYU researchers prepare to take picture from Navesink Lighthouse tower. Darrell Hill, left, takes light reading while Fred Bengston sets camera mount.

As the scientists moved their gear away, caretaker William Kennebeck took charge of the house, made obsolete by radar and sea-based lights. But unlike most Government-owned lighthouses which have been scrapped or made over into motels or restaurants, this lighthouse will become a historical monument and marine museum with a surrounding park.

Science News Letter, April 16, 1955

MEDICINE

Length of Smoke Important

► **HOW SHORT** you smoke your cigarette is found to be important by the chemical laboratory of the American Medical Association.

The latest of a series of reports on cigarettes, cigarette smoke and filters appears in the *Journal of the American Medical Association* (April 9). It is summarized by the American Medical Association as follows:

"If you are concerned about how much nicotine and tar gets to your mouth when you smoke, you almost have to have a chart in your hand. If you want the least amount, you would do well to smoke a king-size laminated asbestos-paper filter cigarette, but only if you put it out while the butt is about an inch and a half long. If you smoke it any shorter, you get more nicotine and tar than from a regular size."

"Other filtered king-size cigarettes let a little more nicotine and tar through. A

regular length no-filter brand screens out still less, but you can smoke it down to about an inch and get less nicotine and tar than if you smoke a king-size right down to the filter. You would be better off if you smoked even a non-filter king-size and threw it away when it got to the inch-and-a-half stage. This means, the laboratory said, that you cannot get more protection and a longer smoke at the same time, in spite of what the advertisements say.

"It does not seem to make much difference whether you smoke a regular cigarette or some filter tip kind, since tobacco itself is as good a filter as some of the tips. But a length of filter made from cellulose acetate fiber, asbestos-paper, or activated charcoal with paper is a more efficient screener than the same length of tobacco at the end of a regular brand."

Science News Letter, April 16, 1955