



MICROANALYSIS

Minute specks of matter are made to yield their history and chemical composition in this newest trick of chemistry. C. G. Van Brunt, chief of General Electric's micro-chemical laboratory, transfers a tiny specimen to a small centrifuge flask. This unposed picture of a scientist at work shows a laboratory table crowded with apparatus. Note the tiny Bunsen burner in the foreground, no larger than the match box.

to trade part of the years spent in high school, college, or graduate study for the most modern nursery school training, if a child could not have both. Of course, the nursery school experience would undoubtedly make him better material for an advanced education.

State University of Iowa studies show that I.Q. is increased by an affectionate and intelligent environment in home and nursery school. This gives added impetus to the idea that the age for conventional beginning of schooling should be extended downward. Two or three

instead of six would be the age at which the children would start to school.

School for the two, three, four and five year olds is different from what it is for the older children in the grades. There is more individual attention and there is no air of the conventional school room. Teachers and children work together to create a little world that is fitted to the abilities and interests of these little beginners in life. There is no hurry-hurry or urgent drive to learn. Nursery school children want to go to school. It is fun to go. Just as older chil-

dren in the more successful schools now want to go.

Our public schools extended their sphere first upward into the high school and then the junior college. Now they give promise of eventually starting the child's education earlier.

Science News Letter, March 25, 1939

CHEMISTRY

Whey, Once Mostly Wasted, Now Finds Profitable Uses

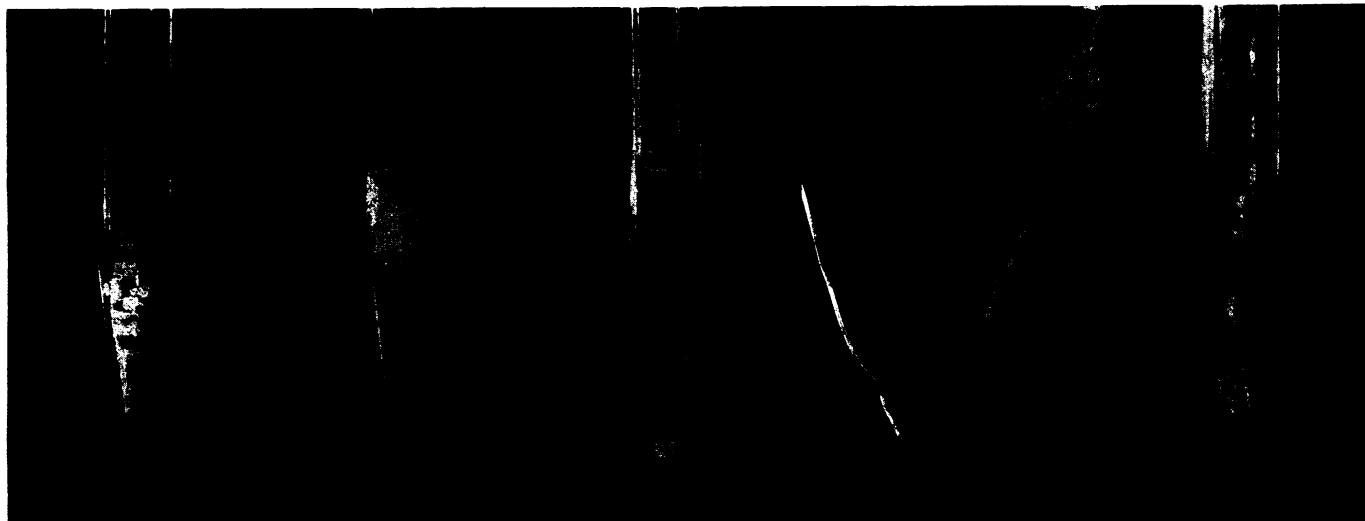
WHEY used to be something we heard of in connection with Little Miss Muffet's misadventures with a spider. Only if we were in the dairy business was our knowledge more extensive—and more painful. Whey was the leftover part of the milk after everything valuable had been taken out, smelly to have around and troublesome to dispose of. Whey was the milkman's headache.

Objectively, whey is the watery liquid left after cream has been extracted for butter and the solidifiable protein (casein) taken out for cheese. It contains some protein and a good deal of milk sugar. It isn't really palatable: Miss Muffet probably just used the spider as an excuse to spill the stuff, which she was eating under parental duress anyway.

Now, however, thanks to the imagina-

WHIRLED

At left the sintered specimen is placed in a tiny centrifuge tube. In solution form the sample under analysis is whirled around to effect a mechanical separation of the precipitate created by reagents. After centrifuging the precipitate comes to rest in the apex of the tube ready to be removed for analysis. Tiny hooks are made of platinum wire for use in handling the small samples. The inertness of platinum to acids and to hot flames makes it a valuable metal for chemical work.



tive ingenuity of Department of Agriculture chemists, uses both dietary and industrial are being found for whey. The Miss Muffets of the future will get their whey in the form of candy, pastry, pudding and meringue. It will figure in the tanning of the leather for shoes and handbags, in the making of plastics for toilet sets, automobile panels and shiny high heels.

Whey is produced in simply awesome quantities in this country—enough to float a whole navy. It comes mainly from the cheese industry, to the amount of well over five and one-half billion pounds a year. Production of industrial casein adds more than another billion pounds.

The greater part of this is still fed directly to livestock—mainly the omnivorous and indiscriminating pig. But use as swill is a low-grade, low-price outlet; better and more profitable to find uses in human food and manufactured products if possible. That is what the chemists have been doing.

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ENTOMOLOGY

Grasshopper Plague Depends On Turn of Weather Now

GRASSHOPPERS will either reach plague proportions next summer or will remain relatively harmless, according to the turn of the weather from now on. If it is persistently cool and rainy, especially in the late spring, hatching will be retarded and young hoppers will be killed. If it is dry and warm there will be new trainloads of poison bait and armies of men to scatter it.

Surveys of the U. S. Department of Agriculture indicate a great wedge of grasshopper eggs distributed across the country from western Washington to northern Michigan and coming to a blunt tip in Texas. Most severe infestation follows two long lines: one right along the western boundaries of the Dakotas and Nebraska, on down to the Texas panhandle; the other from western Minnesota to an especially bad spot in western Iowa and eastern Nebraska, thence across southern Iowa and along the eastern "bulge" of Illinois. There is also an isolated island of infestation along the Mississippi river bottoms of Arkansas, Tennessee and Mississippi.

Grasshopper eggs were laid abundantly last fall, and the winter weather does not affect them to speak of. It is only when they are emerging from the eggs and crawling about as infant insects that they are susceptible to chill and wet.

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ASTRONOMY

New 82-Inch Telescope Receives Its First Starlight

THE NEW giant among telescopes, the 82-inch mirror of new McDonald Observatory, Fort Davis, Texas, has been given its baptism of starlight and proved to be practically perfect in mirror quality and operation.

For a number of nights, it was learned, the new telescope has been in use.

"Every new observation will mean an addition to our knowledge of the universe," said Dr. Otto Struve, director of both Yerkes and McDonald Observatories, after the preliminary observations.

The telescope was first pointed at a star on March 2. When brought to a focus the star image was steady and sharp, showing that the mirror was practically perfect. Photographs of brighter stars and of the moon were then obtained at the Cassegrain focus of the instrument. The first star whose spectrum was photographed was the fifth magnitude object, 17 Lepocis, located south of Orion. This spectrum shows many features never before recorded with any instrument.

The McMath type electric drive con-

trols the telescope so accurately that once adjusted for an observation the astronomer does not need to stay at the eyepiece to guide the telescope. The astronomer at the telescope moves it into position by push-button controls.

Since all mirrors of the 82-inch telescope are coated with aluminum, observations in the ultraviolet region of the light spectrum will be particularly efficient. Most of the old telescopes are designed in such a way that the ultraviolet light is lost, even when the conventional silver mirror coating is replaced by aluminum with its superior reflecting power in the ultraviolet.

A group of eager astronomers who made the tests included Dr. Struve, Prof. George Van Biesbroeck, Prof. Gerard P. Kuiper, and Prof. C. T. Elvey of the joint Yerkes-McDonald Observatory staffs, as well as Dr. J. S. Plaskett of the Dominion Astrophysical Observatory at Victoria.

McDonald Observatory was built by the University of Texas and is operated jointly by that university and Yerkes Observatory of the University of Chicago.

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AGRICULTURE

Brazil-U. S. Agreement Is Part of Greater Plan

THE ARRANGEMENT for cooperative agricultural research included within the new Brazil-U. S. trade agreement is part of a greater plan which is intended to extend American research facilities to all tropical American countries, with a view to mutual interchange of products that will not interfere with existing agricultural systems.

Possible developments under the new arrangement include: re-establishment of the Para rubber industry, now largely in the hands of the British and Dutch in the East Indies; stimulation of existing trade in cacao, cubé (for insecticides), palm oils and waxes, manioc, etc.; development of traffic in tropical fruits through better refrigeration facili-

ties; experimentation in new crops like tea, spices, hemp and jute.

Bills now before Congress call for appropriations to finance three specific projects:

- (1) The establishment of a new agricultural attaché in Rio de Janeiro.
- (2) A survey of the tropical resources of Brazil by scientists of the U. S. Department of Agriculture.

- (3) The loan of Department of Agriculture research workers to investigate problems of Brazilian farms and forests.

Similar set-ups for other Latin-American countries are contemplated. Additional agricultural attachés are planned for Mexico City, Havana and Panama. There is already one in Buenos Aires.