SCIENCE NEWS

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A NEW COMET

A NEW comet, visible to the naked eye, is in the early morning sky. It was discovered by Percy M. Ryves, an English amateur astronomer resident in Zaragoza, Spain, who reported his discovery to Harvard College Observatory asking for confirmation. Harvard notified Yerkes Observatory, and Professor G. Van Biesbroeck, at Yerkes, observed it as faintly visible to the naked eye at dawn. It has a short tail. Its exact astronomic position on the morning of August 14 was right ascension eight hours four minutes thirty-two and a half seconds and declination north twenty-two degrees twenty-four minutes forty-six seconds. Professor Van Biesbroeck found it difficult to photograph the new comet as no long exposures were possible.

"Ryves' comet, which is new and the brightest in several years, was probably found with the naked eye," Dr. Harlow Shapley, director of the Harvard College Observatory, explained.

The new comet is in the constellation of Cancer and is moving northeastward. It now rises one and a half hours before the sun.

As the brightest comet to be observed since 1927, the new comet will be observed widely. In December, 1927, Skjellerup's comet was observed in full daylight near the sun. Though a number of other comets have been observed since then, all have been so faint as to require a telescope to see them.

As soon as three observations of the new comet are obtained at different times, it will be possible to calculate the orbit in which it is moving. It may then prove that the comet is getting brighter and that it will be a conspicuous object in the night sky. On the other hand, it may have already passed closest to the sun and now be decreasing in brightness. Calculations of its orbit will be made at the University of California, the chief center for such work.

Ryves' comet is fourth magnitude, which means that it is of such brightness that except for its closeness to the sun it would be easily visible to the unaided eye.

The latest comet discoverer, Percy Mayow Ryves, is an experienced variable star observer who has a five-inch refracting telescope and a ten-inch reflector at his private observatory in Spain.

FLEAS AS CARRIERS OF TYPHUS

FLEAS, long suspected of transmitting endemic typhus fever in the United States, have at last been convicted of the offense by conclusive evidence, according to a report of the U. S. Public Health Service. The proof that rat fleas are a transmitting agent for the disease was obtained by laboratory tests.

For months, Drs. R. E. Dyer, A. S. Rumreich and L. F. Badger, of the U. S. Public Health Service, have been working on the case, to determine once and for all whether fleas were responsible for spreading the disease, or whether some other agent should be sought. In Europe and Asia, typhus is spread by the body louse, but cases in the United States have occurred where no such source of infection was possible.

In February, the doctors reported that their experiments had reached a point at which it seemed almost certain that fleas are typhus carriers. Now, that belief is confirmed. The proof was obtained by injecting white rats with the virus of endemic typhus, and then putting fleas on them. Six of these fleas were later emulsified and injected into two guinea-pigs. Both guinea-pigs developed the symptoms of endemic typhus. Other fleas from the infected rats were placed in a new box containing some white rats infected with typhus and some non-infected. In two weeks, one of the rats that had not had the disease was killed and fleas from its body were again treated and injected into guinea-pigs, and the disease developed in the guinea-pigs. Other experiments added to the evidence of the rat fleas as the carriers.

SUGAR IN AMBER

SUGAR that has been aged in amber for scores of thousands—possibly hundreds of thousands—of years, and is yet fresh enough to supply food to living plants, has been studied in Berlin by Professor Dr. Johannes Gruss, well-known German researcher on the evolution of yeasts and fungi.

The microscopic traces of sugar were always found in connection with insects that had been trapped in the amber while it was still oozing from the pines on the ancient Baltic shores, as a soft, sticky resin. Buried in the silt the resin slowly fossilized into amber, preserving insects, bits of flowers and chemical substances caught in its air-tight substance.

The insects responsible for the presence of sugar in the amber were always either bees or butterflies, which are honey-gatherers, or aphids, which suck sap out of green shoots and leaves and convert it in their bodies into a sweetish stuff called honey-dew, eagerly sought by ants. In their struggles as they sank into the tangle-foot resin in which they were trapped, these insects apparently exuded some of the sugar-coating fluids, which after losing their water through evaporation remained as nearly pure sugar.

The amber specimens examined by Professor Gruss were all of Tertiary geologic age, and he estimates them to be from 60,000 to 80,000 years old. This estimated age will be regarded as exceedingly conservative by many geologists, who are willing to accept a time period as great as a million years since the close of the Tertiary. Whatever may be their age in years, Professor Gruss' sugar samples are probably the oldest sugars yet discovered.

However, old as they are, these sugars have shown themselves to be quite serviceable as food. Many of the

amber sections which Professor Gruss was examining at the Berlin Museum of Natural Science became mouldy with two species of fungi feeding on the contained sugar. One of the species was new to science, and has been named *Cladosporium circinalis.* This mould grew only on the sugars left in the amber by perishing aphids.

Professor Gruss, who attracted attention some time ago by studies of yeast cells in 4,000-year-old Egyptian beer jugs, was hunting for yeasts still older when he began his researches on amber. He found them in great abundance. Most of them were flower-yeasts, found then as to-day mainly in the nectars of flowers, and carried from one flower to another on the mouthparts or heads of visiting insects.

These ancient flower yeasts were very similar to their modern descendants, tending, however, to be smaller in size and simpler in organization. As adaptations to insect travel, they formed their chains of cells into crosses, anchors and other figures that would catch and cling to the insects' hairs. Besides the true flower yeasts, Professor Gruss found a number of other yeast species and several moulds.

COCHINEAL BUGS TO DESTROY CACTUS

COCHINEAL bugs are used to destroy cactus clumps that harbor dangerous snakes in southern India. The bugs were imported by C. T. Jacob, as an experiment.

Two months or more after the insect has been set to work, the cactus plant begins to show the effects, and puts on heroic efforts to bear fruit. But it collapses instead. After that, Mr. Jacob noted that the insects breed mostly males with wings. Female cochineal has no wings. The insect, too, shows very safe tastes. Grass and weeds that spring up immediately where the cactus died are untouched by the insect pest.

Cactus and cochineal both are native to America, probably to Mexico, for there more species of the plant are found than in any other place. Before the Spanish Conquest of the New World the Aztecs of Mexico raised cochineal on cactus for dyes. The natives still use it in places to-day. The Spaniards took it to the Canary Islands, and ran a very profitable business there, until the Germans discovered aniline dyes in modern times. Other countries had imported the cactus, too, for the same reason, but in some cases with disastrous results.

In Europe cactus did no harm, but in Australia it has infested great grazing areas, and in South Africa, too, it is becoming a problem. The fact is conditions were too ideal for its propagation. The natural enemies of the genus did not exist in Australia and other places as they existed in America. In Mexico, land of the cactus, it has reached a nice biological balance with its natural enemies.

One of these enemies is the cochineal bug. The species *Dactylopius tomentosus* is the one that has now been imported into South India. The cactus that it fights there is the *Opuntia dillenii,* which forms the lair of dangerous snakes.

The cochineal bug is a soft-bodied scale insect. It is covered with a fine white down made of sticky white threads. The insects are very prolific and breed about a generation a month. On hatching, the tiny "crawlers" wander over the plant, and when they find a favorable spot they sink their tiny trunks into the cuticle of the plant and stay there the rest of their lives. Their legs seem to atrophy, and if the insect is removed it dies.

It is believed by the feeding alone, the insect could not wreak such havoc with the plants. Mr. Jacob suggests that it may introduce a virus into the cactus, or a bacterial disease. The fact that on the death of the plant, the insect suddenly begins to breed large quantities of males, is very curious too. It is as if it were a consequence of starvation, or of a changed composition of the juices of the plant.

DROUGHT CENTERS

DROUGHT has shifted its center this year. In the central valleys of the country, where last summer a continual blazing sun made conditions the worst, rain now falls; and this time in the northwest, unyielding skies have been seen the longest. But the stricken area is less than was the drought focus of 1930, according to Joseph B. Kincer, of the U. S. Weather Bureau, and the country as a whole is faring better.

Montana, Minnesota and the Dakotas, after experiencing their dryest winter, have been getting a double dose of heat and lack of precipitation. Since January 1 the rainfall in these states has been about a third below normal. For the six-month period, figures from the U. S. Weather Bureau show, North Dakota averaged 60 per cent. of the normal rainfall while for the same period in 1930 its average was 92 per cent. normal. For Montana the average is 51 per cent. during the past six months as compared with 73 per cent. normal for the time last year.

That the drought is serious in the north central and western states, is shown by the fact that for the month of July alone 200,000,000 bushels of the nation's corn crop have been lost. Heavy drops, ranging from 4 to 137 million bushels, have also been reported in July for oats, barley and other small crops, while the decrease in the spring wheat yield is the greatest on record.

In contrast to these losses, Arkansas, probably the worst sufferer during last summer's dry spell, is having bumper crops—twice as much cotton as last year—and the rainfall average has jumped from 19 per cent. of normal for July, 1930, to 157 per cent. of normal for the same month this season!

Pasture lands are feeling the grip of the present drought most keenly. From Ohio westward, Mr. Kincer says, at least a third of the states have the poorest or next to the poorest pastures on record. As the center of this summer's drought area, South Dakota has the poorest in the state's history, and with the exception of two or three states in the past, is harder hit in respect to pastures than any other state in the country in any year.

Mr. Kincer explained that in its entirety the United States was not suffering from the drought as much as during last year because the drought center is consider-

ably smaller this year and because the rains, though few in comparison with normal years, have been well distributed and have come at intervals necessary to keep crops in general from failing.

"As a result of last year's drought," he said, "which removed practically all of the soil water, crops have had to live a 'hand-to-mouth' existence from one rain to another."

It was also pointed out by Mr. Kincer that the dry conditions at present are but a continuation of last year's rainless weather, inasmuch as in only three of the past 17 months has rainfall for the country been as much as normal. The expression "normal," he stated, meant an average in rainfall for the last fifty years or so.

One factor that has made the area including the Rocky Mountains and westward drier now than last year was the absence of appreciable snowfalls during the past winter. This has lessened considerably the amount of water for irrigation.

CALENDAR REFORM

THE State Department may soon make an announcement regarding an official delegate from the United States to attend an international conference on calendar reform in Geneva in October.

The calendar reformists led by George Eastman, retired president of the Eastman Kodak Company, want thirteen months instead of twelve, each with twenty-eight days; or else twelve months neatly catalogued into four quarters of 91 days, 91 days, 91 days and 92 days, respectively.

It seems somewhat questionable at this time, however, as to whether the world wants its calendar to be reformed. Unofficial collections of opinion in various countries, through the medium of questionnaires sent to clubs, business organizations, and so on, have seemed to indicate that only in Germany and the United States is there marked enthusiasm for the venture. Switzerland, too, is inclined to favor it. Marked public apathy is reported in Portugal, France, Great Britain and Italy, according to the report just released of the Preparatory Committee on Calendar Reform which met in Geneva last June to prepare a basis of discussion for the conference in October.

The United States had a delegate at the meeting of the Preparatory Committee—Dr. Charles F. Marvin, chief of the U. S. Weather Bureau, who is known to be as enthusiastically favorable to a calendar reform as George Eastman himself. But Dr. Marvin at that meeting did not officially represent the United States nor in fact did any of the other committee members represent their governments. The committee expressly stated that the members did not look upon themselves as spokesmen of the whole public opinion of the countries from which they came.

When official delegates are appointed, however, and meet with the Transit Committee of the League of Nations on this problem, their words will be watched because it will be assumed that they speak with authority and will be backed up at home in the stands they may take on whether there should be a new month interposed between June and July to be called by the solemn name of "Sol," or given some other designation.

Many of the big, powerful countries of the world are interested, but think we are doing very well as we are and that any change should be made very cautiously and not until it is clearly shown to be highly desirable. On one point almost universally the countries believe a change would be beneficial; the establishment of a fixed date for Easter.

While Congressional action for the appointment of a delegate from this country to the October Geneva conference is unnecessary, any action taken in regard to a new calendar would have to be ratified by Congress to be effective.

ITEMS

WESTERN China was the location of a severe earthquake on Monday (August 10) afternoon at 4:18 P. M., E.S.T., seismological reports wired *Science Service* and interpreted by the U. S. Coast and Geodetic Survey indicate. The center of the disturbance which may have killed many people was in the Sinkiang Province of China on the west edge of the Gobi Desert, an area sparsely settled and remote from communication lines. It may take weeks for news of the actual damage done to reach telegraph lines. Seismographs all over the world vibrated for hours with this shock which was one of the most severe of the year. The longitude and latitude of the epicenter as determined by the U. S. Coast and Geodetic Survey was 90 degrees east and 42 degrees north.

THE U. S. Coast Guard's oceanographic vessel, *General Green*, has returned from a four thousand mile cruise between Labrador and Greenland. Observations of temperature and salinities were made at 122 points in six crossings of the Labrador current and two sections between Labrador and Greenland. These measurements were taken in thirteen levels down to depths of two thousand meters (six thousand feet). More than seventeen hundred soundings were taken. On the Labrador coast about one hundred icebergs were sighted. Hundreds of bergs must be grounded and are disintegrating along the coast. Hudson Strait is free of ice, only three bergs being sighted. Remnants of pack ice and about five hundred icebergs were sighted between Ivigtut and Cape Farewell, on the south tip of Greenland. Of all the bergs seen, only two were more than sixty miles off shore.

A LOCOMOTIVE of 350 tons, measuring 100 feet in length, will soon go into regular service on a Canadian rail line. The new locomotive has both high- and low-pressure boilers, the exhausted steam from the high-pressure system being used in the low-pressure cylinders. The engine is the largest and most powerful of its kind ever built and the first of its design to appear on the American continent.