each different kind of metal known, so that if the "fingerprint rays" could be sorted out in some fashion a chemical identification is possible.

The apparatus for analyzing the tell-tale secondary X-rays consist of a crystal of pure salt shaped into the form of a cylinder. This cylinder does for the mixed-up secondary X-rays what an ordinary prism of glass or a spectrum grating does for white light—it breaks it up into its colors, or wavelengths.

As the X-rays come from the salt crystal they strike a photographic plate at different places and leave marks which distinguish each metal present in the original sample of metal.

Dr. Hamos is carrying out his research in the Rikmuseets Mineralogiska Avdelning in Stockholm. His method is adapted for the rapid analysis of metals and metallic ores where the sample's appearance must not be changed.

Science News Letter, August 25, 1934

AIRPLANE NOISE ANALYZED DURING FLIGHT

The fact that an airliner is noisy is common knowledge, but the elements of which the noise is composed are of great interest to scientists because they may show the way to curing airplanes of many of their sound ills. Westinghouse engineers are taking data on all the sound vibrations occurring in an airliner cabin while the ship itself is in midair.

PHILATELY

Government Now Honors Science on Postage Stamps

WITH the issue on Aug. 15 of the General Goethals 3-cent Canal Zone stamp, commemorating the twentieth anniversary of the opening of the Panama Canal, another phase of American science was dedicated to the mails.

Postage stamps have recorded history for the people more widely than history books, but most of their illustrations have been kings and presidents.

When the new commemorative stamp went on sale at Colon, the Post Office Department of the Canal Zone placed on visual record George Washington Goethals, chief engineer and administrator of one of the world's greatest engineering feats.

His first two names bring to memory another engineer and builder, who was later to become the first president of the United States. First a surveyor, and then a civil engineer, George Washington built power dams and canals, many of which are still visible in Virginia. He appears on the standard 2-cent and 3-cent U. S. postage stamps.

Benjamin Franklin, whose likeness appears on the present 1-cent stamp, is better known for his scientific work than Washington. As a pioneer in the field of electricity, much of the credit for our present comforts should be given him.

Thomas Jefferson, although chiefly famed as a barrister, diplomat and statesman, was a student of the sciences. He is said to have made use of higher mathematics, especially the calculus, all through his life, and he studied fossil bones in the White House East Room.

There is a custom in this country which forbids the use of any living person's picture on a United States postage stamp. Even a living person's name was once barred. Because of the importance attached to Lindbergh's flight across the Atlantic in 1927, a 10-cent stamp bearing his name made him the first living man to be immortalized by the Post Office Department. Two years later the rule was broken a second time, when a postage stamp appeared which carried the name of Thomas A. Edison. This issue honored the fiftieth anniversary of the first Edison electric light.

Stamps are used for other purposes than postage. For the benefit of game birds, especially ducks, a dollar hunting license stamp will be issued, the receipts to be used for the development of bird sanctuaries. J. N. ("Ding") Darling, noted cartoonist and now chief of the U. S. Bureau of Biological Survey, designed the stamp.

Foreign countries have given philatelic honors to their famous scientists. The physicist Volta, pioneer in electricity for whom the "volt" was named, was commemorated by Italy in a stamp issue. Pasteur, father of bacteriology, and Berthollet, the chemist, have both appeared on French stamps.

Science News Letter, August 25, 1934

PHYSICS

Speech "Compressed" To Carry Across Atlantic

USE OF the radio-telephone for commercial communication with Europe is commonplace today. But few people who sit down in New York and call London over the air realize the tricks of electrical engineering which make possible the proper transmission of their voices across three thousand miles.

Radio telephone users do not know that voice, for example, must first be "compressed" before it is sent out on the radio waves and then "expanded" back to something like its normal characteristics at the receiving end.

Transatlantic telephone companies use a device called a compandor to raise the energy in the voice tones so that they can more successfully compete with static on their lightning-like journey to Europe.

Ordinarily the energies coming into a radio telephone may have a range from

one to 10,000,000. Some are very weak and some are very loud. The weak vowels and weak parts of strong vowels can easily be "lost" in the roar of static.

With the compandor, sound intensities to be transmitted are squeezed, or compressed, so that the ratio of weak to strong sounds is only one to thirty-two. With this smaller variation in intensity the transmitted signal can "stand on its own legs" and fight back when severe static roar comes along.

At the receiving end of the radio telephone is an expandor which takes the compressed signals and spreads them out into their original intensity range.

The value of "pepping up" the speaking tones to higher intensities has improved transatlantic radio telephone transmission as follows:

1. Enabled successful transmission of messages for a longer percentage of time, much of which was previously unusable for commercial purposes.

2. Reduced the static noise impairment of transmission during moderate or heavy static.

3. Made possible an economy of power necessary for transmission during light static.

The technique of "voice squeezing" for radio-telephone and its benefits to transatlantic telephone users are described in the current issue of the *Bell System Technical Journal* by Dr. R. C. Mathes and Dr. S. B. Wright.

Science News Letter, August 25, 1934

ZOOLOGY

Rattlesnake's Rattles Not Part of Its Skin

RATTLESNAKES are not born with "buttons" on the ends of their tails. And their rattles are not simply thickened parts of their skins. These contradictions of two universally accepted articles of rattlesnake doctrine are upheld by L. M. Klauber of the Natural History Society of San Diego.

Furthermore, said Mr. Klauber, there is good evidence to believe that under natural conditions every time a rattler sheds its skin it does add a new rattle to its string, although most natural history books now declare that this does not always happen. The trouble with the books on this point, the San Diego zoologist said, is that their statements are based mainly on the skin-shedding habits of rattlers in captivity, which are usually not normal or healthy.

The "button" we see on the tip of a rattler's string of rattles, Mr. Klauber discovered through close observation of new-born little snakes, makes its appearance only after the snakeling has shed its birth-skin, which it does when it is only a few hours old. Before then, it bears a birth-button, or "prebutton" as Mr. Klauber has named it. This is so thin and fragile that it is not able to cling to the tail-tip when the skin is shed, but comes off with it.

Although related to the skin in origin, the rattles are not merely thickened parts of the skin, Mr. Klauber further stated. They are quite distinct from it, being formed of a hard, clay-like substance which is secreted by a definite body of tissue near the tail-tip, which he calls the rattle matrix. At first soft and doughy, the rattle dries as it matures, and springs away from the matrix that formed it. A fold of skin overlaps and holds the edge of the last-formed rattle, while the rest of the mechanism is held only by its interlocking joints, which permit enough free play to make the rattle buzz when the angry or excited snake vibrates its tail-tip.

Science News Letter, August 25, 1934

ARCHAEOLOGY

Oklahoma's Mound Builders Wore Fancy Stone Earrings

See Front Cover

SOME of the costume jewelry worn in ancient America was amusing stuff.

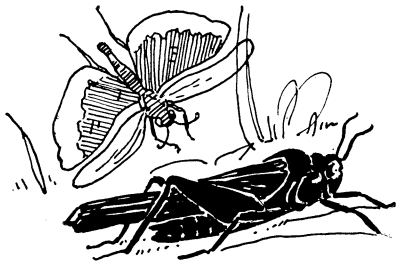
From eastern Oklahoma comes a stone earplug made by an Indian jeweler with interesting ideas of design. The plug, unfortunately broken, is ringed with a maze-like pattern of lines. Once you see it the right way, there is a series of Indian profiles in the puzzle picture.

The plug is from one of the mounds recently explored by Forrest E. Clements of the University of Oklahoma. The mounds revealed copper blades, well-made cloth, and other signs showing that a high Mound Builder culture flourished in Oklahoma.

Science News Letter, August 25, 1934

ENTOMOLOGY

NATURE RAMBLINGS by Frank Thone



Double Trouble

UNABATED heat and drought over most of the country's major grain areas resulted in indirect as well as direct damage to the crops, by encouraging some of the most destructive of insect pests.

A survey by the bureau of entomology, U. S. Department of Agriculture, shows that the grasshopper situation throughout the West is still very serious. With late summer coming on, the insects are maturing and preparing to lay their eggs in the baked soil. There they will remain during the winter, and if the season is as warm and open as it was during the winter of 1933-34, the summer of 1935 can be expected to be another bad 'hopper year.

Chinch-bugs, though defeated in their effort at ground invasion of the cornfields after the small-grain crops had either been harvested or dried out by the drought, took to the air and entered the corn in considerable masses. They have not done the present year's crop serious harm in most places, but the insects now feeding in the cornfields will lay eggs, and the second generation of bugs, sheltered among the wild grasses in fencerows and on roadsides, will be ready for major mischief early next summer, unless a chill, rainy autumn diminishes their numbers.

Wheat in the Ohio valley was subjected to a severe attack of Hessian fly, and near the headwaters of the Ohio there was a serious outbreak of the black grain-stem sawfly. Red spider, favored by the drought, has been attacking a great variety of plants over all the eastern half of the country except the Southeastern states and New England. Corn earworm has been troublesome over practically the entire United States.

Science News Letter, August 25, 1934