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Each class is limited to 75 students, men and women being admitted on the same terms. Except in unusual circumstances, applications for admission will not be considered after July 1st.

If vacancies occur, students from other institutions desiring advanced standing may be admitted to the second or third year provided they fulfill our requirements and present exceptional qualifications.

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The academic year begins the Tuesday nearest October 1, and closes the second Tuesday in June. The course of instruction occupies four years and especial emphasis is laid upon practical work in the laboratories, in the wards of the Hospital and in the dispensary.

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The annual announcement and application blanks may be obtained by addressing the

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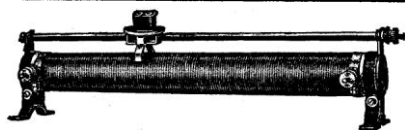
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lished here and based upon a paper read by Prince Ginori Conti at a recent meeting of the Italian Association for the Advancement of Science. The principal source of natural steam is in the Volterra region about 40 to 50 miles south-southwest of Florence.

The steam jets and hot water springs of this district which contains about two and a half square miles have been known for centuries, but power development there is relatively recent. Two 3,000 kilowatt turbo-generators of the Parsons type are now delivering a three phase current at 4,000 volts, which after transforming into higher voltages is carried to the neighboring cities of Florence, Leghorn, Sienna, and Piombino.

The natural steam is obtained from iron encased bore-holes, 16 inches in diameter and from 200 to 500 feet deep. It issues at an average pressure of two atmospheres and a temperature varying from 100 to 190 degrees Centigrade, friction against the walls of the bore causing much of the heat. Recent borings have released steam at a considerably higher pressure and in quantities up to 59 tons an hour.

The steam contains an average of six hundredths of one per cent. of boric acid, which by the latest process is recovered. Four to six per cent. of gases are also found in the steam, these impurities being over 90 per cent. carbon dioxide with small percentage of hydrogen, helium, hydrogen sulphide, argon, oxygen.

In the latest method described by Prince Conti, who has been most active in the industrial development of this region, all these impurities are separated from the natural steam which is then fed directly into the turbines. Earlier methods were the direct use of the steam in reciprocating engines, and the use of steam derived from the boiling of condensed water from the natural steam. This was boiled by the superheated natural steam and used in turbines in place of the natural product so as to eliminate corrosion of the turbine blades from the impurities.

Boric acid of high purity is recovered by evaporating the condensed natural steam in shallow lead pans, the heat being supplied by the uncondensed steam. When a concentration of about eight per cent. is obtained the boric acid is crystallized out on cooling and is subsequently purified by recrystallization. Ten tons of ammonium carbonate a day are produced from the ammonia recovered in the steam at the works at Castelnuovo.

THE COLORADO BEETLE IN EUROPE

Science Service

THE Colorado Potato Beetle, otherwise and more familiarly known to farmers as the potato bug, has followed in the footsteps of the A. E. F., and established himself in Europe. But, unlike the doughboys, they have no return tickets. So firmly are they settled in France that French entomologists despair of exterminating them. "They shall not pass" might stop the Kaiser's army, but no such slogan worried the fighting Yankee bug who, arriving in France some time during the war, proceeded, figuratively speaking, to "cut himself a piece of cake and make himself at home."

The invasion is looked on with dismay by European farmers. Potatoes form a large part of the diet of the average North European, and as historians well know, it was the abundant potato crops of the war years that helped Germany to hold out so long. Quarantines have been established against France by England and other countries in an effort to keep out the invader, and the Germans are especially on guard against this onslaught on their favorite vegetable.

But the busy bug, which has in the space of fifty years crossed the most of the North American continent and the Atlantic Ocean, is hardly to be held at the Rhine. During the war it was seriously proposed by American entomologists to drop potato bugs from airplanes over the fertile fields of the Fatherland, but the project never came to fruition. Now the bugs have taken the matter into their own hands and having been colonized in France through the great volume of wartime shipments of all sorts, they are already chanting their slogan of "On to Berlin."

But if they cross the Rhine they are not likely to stop at Berlin or anywhere else, but to spread generally throughout Europe and Asia, adding another powerful hazard to the risks run by European farmers and giving another illustration of the way commerce has of not only ministering to the needs of men, but also of being of service to his enemies. The gypsy moth, the white pine blister rust, and the corn borer have been brought to America from Europe, and now the potato bug has travelled back along the ways of trade to return with interest the damage caused his native land by his distant cousins of the insect world.

GIZZARD STONES OF DINOSAURS EXHIBITED

Science Service

RELICS of the internal economy of dinosaurs whose eggs are now articles of commerce, which rival in interest those ancient prototypes of the first syllable of a lunch counter breakfast, are being exhibited by Dr. Willis T. Lee, of the U. S. Geological Survey. They are gizzard stones with which, after the manner of modern birds and fowls who are their linear descendants, these brute members of the first families of America ground up in their stomachs the rough and ready food they swallowed some ten million years ago.

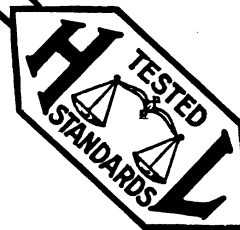
Dr. Lee found these pebbles in the course of his explorations last summer of the oil fields of Wyoming. A bed of red clay lies between two of the oil sands and contains thousands of the pebbles with many fossil dinosaur bones. They are of quartz and agate and vary from less than an inch to more than three inches in diameter. Although irregular in shape they are nicely polished from many years' rolling around in the uneasy dinosaurian stomachs.

These stones are thought to be really gizzard stones from the fact that they are entirely foreign to the geological formation in which they are found and have frequently been found with the skeletons of the dinosaurs, and within the fossil skeletons of some of the aquatic

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(cf.—Osborne & Harris, Jr. Am. Chem. Soc., 25-IV. 346)

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relatives of the dinosaurs. Dr. Lee finds no reason to doubt that the pebbles are gizzard stones except their great numbers and when asked for his reasons said:

"Why not? This morning I had fried dinosaur eggs for breakfast and yesterday roast dinosaur for dinner. In helping my wife to prepare the roast I took several pebbles out of its gizzard. Of course, in these modern times we call them fowls, not dinosaurs. But all wise folks know that fowls are the linear descendants of dinosaurs and since the fowls use pebbles in their gizzards to grind their food, it is not strange that their ancestors did the same. The interesting thing is that the fashion has been so faithfully followed for ten million years."

But another geologist has suggested that these stones may have had an even more striking and peculiar use. Some of the dinosaurs were swamp dwellers. They were huge in size, "bigger than several elephants," said Dr. Lee, and ungainly. So it has been suggested that before wading into the swamp muck where his predatory enemies could not follow, he swallowed a bushel or so of stones for ballast and proceeded to snooze in security. A capsized dinosaur would be out of luck. "This," said Dr. Lee, "is carrying a good suggestion too far." However, it is certain that some of the reptiles that inhabited the open sea had the habit of swallowing stones. Gizzard stones have been found in the chalk beds of Kansas nearly one thousand miles from their probable source.

Incidentally, these gizzard stones have an important economic use. The red clay in which they are found, and which is 50 to 200 feet thick, forms a layer between the lowest and the next to the lowest of the oil sands of the Cretaceous beds of Wyoming. It contains great numbers of the polished pebbles giving a clue to the large extent of the dinosaur population in those days so long ago. Any well driller, says Dr. Lee, can distinguish the clay from the oil bearing sands by its color. Thus in drilling such important structures as the Salt Creek oil field and Teapot dome, the pebble-bearing clay is a recognizable key rock.

"It is an interesting thought," says Dr. Lee, "to consider a hundred ton dinosaur billing over the rocks about his native swamp, and selecting from the worthless material the agates which would take a beautiful polish in his internal lapidary mill, to be handed down to admiring posterity as beautifully finished ornamental stones."

DUST EXPLOSIONS

Science Service

New means of preventing disastrous dust explosions were made possible by the government's study of the starch dust explosion at Pekin, Ill., which killed 42 persons and caused over a \$1,000,000 damage.

Investigations just reported by David J. Price, engineer of the U. S. Bureau of Chemistry, make clear that this disaster was caused primarily by a small fire from an over-heated bearing of a starch conveyor. The damage from this fire was negligible, but it was sufficient to set off the starch dust which rose when a small starch wagon was dumped into a bin.

If the fire and explosion had been confined to this small bin the damage would have been small, though

several nearby workers were burned. The great disaster came from the travel of the explosion through the dust cloud which existed all the way along the conveyors which carried starch from the bin to another building. It seemed unbelievable that the small amount of dust in a conveyor tunnel should have been enough to carry the explosion down through the basement, under ground for a considerable distance to another building, and there to set off the whole packing department. But the evidence was conclusive that the flame did travel in this fashion.

Any dust which will burn in the air may become as dangerous as a high explosive. Government engineers advise separation of buildings where dry combustible dust is handled. They point out that buildings with large widow area are much safer if such explosions are likely to occur, because in case of explosion the windows are blown out and relatively little damage results to the walls and floors of the structure itself.

These results are applicable in any plant where powdered coal, ground starch, cocoa, spice, other fine combustible dust, or even metal dust is produced and handled. In such plants there is as much need for care as in dynamite or powder factories.

ITEMS

Science Service

LEE S. CRANDALL, curator of birds of the New York Zoological Park, in a report to the American Game Protective Association warns that unless the few fortunate possessors of aviary pheasants cherish and increase them during the coming breeding season all species are in danger of becoming virtually extinct. The industry of collecting and distributing wild birds and animals has been badly demoralized by the war, and American breeders can no longer depend upon European importations for supply. The seed stock of many kinds of game birds and waterfowl has become dangerously reduced, and even if it is possible to obtain fresh stock, the newly-imported, wild-caught birds often breed with great reluctance, and years must pass before a prolific breeding strain can be developed.

PACIFIC trade winds will be used in an attempt to blow disease out of the Samoa Islands, according to plans of Dr. Patrick A. Buxton, leader of the expedition of the London School of Tropical Medicine which will set sail for the South Seas on November 15. Tuberculosis and other diseases threaten the extinction of the natives of the Samoa group of islands and it is thought their susceptibility may be due to a condition caused by a tiny parasite carried by the *Stegomyia* mosquito. This mosquito does not seem to be able to exist where the dense undergrowth is cut down. By cutting airways through the dense jungle so that the Pacific trade winds can blow through it, it is hoped that the insects will be blown away. An intensive attack, which will also include substituting modern cisterns for the hollowed coconut tree tanks, which furnish breeding places for the mosquitos, will be made first on one small island. This island will be an object lesson for the larger islands of the group. The expedition is expected to be in the tropics for two years.