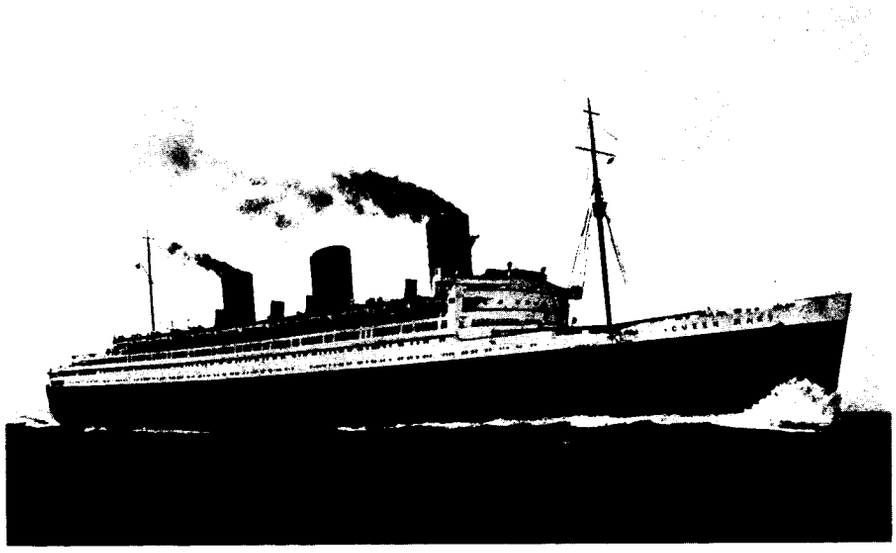

THE QUEEN MARY

CHEMISTRY-AGRICULTURE

Death Knell of Cotton Pickers Suggested at Conference

ROMANTIC pictures of singing cotton pickers down in Dixie, already threatened by the development of a machine to do the picking, are in danger from another quarter, it developed at the meeting of the second Dearborn Conference of Agriculture, Industry and Science, held this year in Detroit.

Dr. Frank K. Cameron of the University of North Carolina put forth a proposal to grow the cotton thick in the field, forcing the largest possible number of bolls to maturity at the same time, and then cut and dry the whole business, as prosaically as so much hay.

These whole dried cotton plants are to be ground down to a powder and then put through a double chemical treatment. The first step will extract the oil, the second will digest both the cotton and the cellulose of the stalks into alpha cellulose, basic material in the manufacture of rayon and other modern products of chemical industry.

Only Possible Salvation

Dr. Cameron has been carrying on fairly large scale experiments for several years, and is anxious to see his method tested out in other cotton growing sections. He is convinced that for his own part of the South, where cotton was first grown in this country, it is the only agricultural and economic salvation.

The land there is too hilly for the use of tractors, cotton picking machines and other types of "cotton field artillery" that have come into action on the flatter terrain of the western Gulf states. So the mowing machine and the chemical kettle bid fair to exile the singing cotton field "hands" and the cotton gin to the only territory where they have been really profitable for the past few years —upper Broadway.

When a Plant Bites, That's News

The cowboy's boast in the old song, that "rattlesnakes came out and bit me—and then crawled away and died!" is made good by plants when treated with certain substances that makes their sap poisonous to sucking insects, though the substances themselves may not have any poisonous effect if applied directly to the pests.

This curious phenomenon of plant immunity to insect bites was discussed by Prof. Dwight M. Delong, of Ohio State University.

The insects belong to the group known as leafhoppers. They afflict the plant by sticking their sharp little beaks into the leaf-veins and sucking the sap, much as mosquitoes afflict mankind. Usually they can be killed only by what are known as "contact insecticides," which immediately wipe out the insects they touch, but have no effect on later comers. (*Turn to next page*)

MARINE ENGINEERING

Seaworthiness of New Ship Insured by Sound Planning

By BENJAMIN WISTAR MORRIS

(EDITOR'S NOTE: Mr. Morris, a leading architect of New York City, served as joint counsel and designer on the planning and decoration of salons of the *Queen Mary*, and as personal adviser to Sir Percy Bates, chairman of the Cunard White Star Board.)

See Front Cover

SHIPS designed to cross the North Atlantic in winter as well as summer must stand such enormous stresses as are engendered by high seas. Into the Cunard White Star liner *Queen Mary*, destined for year-round service, experienced builders instilled seaworthiness by means of sound planning.

Structure as required by the British Board of Trade was the first consideration and no concessions were asked for by designers of the ship's interior. Beauty within the ship consists of arranged construction, embellished with an economic, sparing, and studied use of ornament. For good and practical reason, the *Queen Mary* does without the glories of unbroken vistas extending the length of the upper deck.

Her three direct uptake funnels arranged along the center line of the ship continue directly upward to their outlets, instead of being deflected up the sides and over the promenade deck as is the case with a number of vessels of Continental design. In addition two large engine hatchways are installed further aft along the center line. Taken together, the funnels and hatchways comprise five unbroken elements of structural steel rigidity extending through the entire height of the ship, into which extra heavy deck plates and girders were tightly woven, the whole bracing the horizontal structure at every level.

Extra thick plating was provided for the ship's double hull, which extends as far up as the waterline, and for her sides and decks, while ribs are more closely spaced than heretofore. The great strength built into the hull is borne out by the vessel's weight, her 77,500 tons displacement exceeding that of any other ship by about 10,000 tons. And the *Queen Mary* has a longer waterline length—1,004 feet—than that of any other ship, yet she is several feet shorter than the longest overall. This can only mean that the *Queen Mary* has the greatest foundation or supporting size with relatively less superstructure to carry. Other things being equal, it is the primary factor of waterline length that determines added steadiness and speed.

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However, it has been found that certain copper compounds, and more especially certain forms of sulphur, will cause changes in the plant's sap, making it poisonous to the leafhoppers for many days. Most of the compounds are not directly poisonous to the insects themselves. Moreover, they are not soluble in water, and it seems improbable therefore that any great amount of them gets into the plant juices. How they cause the plant to become poisonous to the insects has not as yet been found out, but the fact remains that they do have this effect.

Pyrethrum, a plant that is always poisonous to insects, if it is used aright, may become a profitable crop in the United States, making part or all of the present imports from Japan and Jugoslavia unnecessary, R. E. Culbertson, research fellow of the Crop Protection Institute, told the meeting.

Pyrethrum belongs to the chrysanthemum family, and looks like a tall white daisy. The active principle extracted from its dried flower heads, called pyrethrin, is what puts the lethal "kick" in many widely used household insect-killers. Over thirteen million pounds of dried pyrethrum is now imported annually.

Mr. Culbertson has had test plantings made in thirty states, under a wide variety of climatic and soil conditions. Results indicate that the plants will grow well in all parts of this country, and that the paying pyrethrin content is just as high in the domestic product as in the imported. Weather affects the quality of the crop: there is a higher concentration of pyrethrin in hot, dry seasons than in wet, cool ones.

Riding in Corn

When you buy a shiny new automobile for the family, a pair of patent-leather sandals for your wife, or a brightly-lacquered toy for one of the kids, you may be consuming corn and cotton in disguise. Charles L. Gabriel, New York industrial chemist, explained how.

Corn and other grains were used in large-scale production of only one chemical, ethyl alcohol, pre-war days. Now they are fermented into many other useful things.

Prominent among these uses is butanol or butyl alcohol, used as a solvent for cotton in the preparation of bright modern lacquers and leather finishes. Another is methanol or wood alcohol, which can be converted into formaldehyde, widely used as a disinfectant, in the manufacture of dyestuffs, and in the production of synthetic resins of the Bakelite type.

Power alcohol, for blending with motor fuel, was stoutly advocated by Francis P. Garvan, President of the Chemical Foundation, New York. He held that the addition of alcohol to gasoline is justified from both engineering and economic viewpoints, and that it is absolutely necessary as a matter of national defense.

Mr. Garvan directly accused the Standard Oil Company of New Jersey of devious methods in opposition to the power alcohol program. Furthermore, he added, the same company is "plotting and planning with the German I.G." to monopolize world production of liquid fuel from coal by the Haber process, when supplies of crude oil run low.

He warned industrialists among his hearers that if private business does not take up the manufacture of power alcohol the Government will. Although deprecating Government competition in business, he added, "Do not blame the Government for going into business. When it does so, it is always due to either the sloth or the greed of private interests."

Science News Letter, May 23, 1936

ZOOLOGY

Chain Replaces Steel Jaws In Humane Animal Trap

Invented by Leading Animal Researcher, Dogs and Even Hunters Can be Caught Accidentally Without Danger

By DR. FRANK THONE

TRAPPING animals for fur, for domestication, or to remove them as nuisances, promises to become a much changed and far more humane business than it has been during the long reign of the steel trap, through the introduction of an entirely new type of trap, the invention of Vernon Bailey, veteran zoologist of the U. S. Biological Survey. Mr. Bailey's trap substitutes for the old-time steel jaws a firm-holding but painless chain loop, somewhat reminiscent of the string snares we used as boys, to catch ground-squirrels and gophers. Only it is much stronger, wholly automatic in action, and can be built big enough to capture a grizzly bear.

Mr. Bailey has spent a long lifetime among animals, as their student and their friend. He has hated to see them tortured by steel traps—and often escaping from them, at the cost of being crippled for the rest of their lives. Yet he recognizes the legitimacy of the fur trapping industry, which has for a long time depended largely on steel traps. To produce a better trap, that would never lose its catch and yet never torture or maim the animal, has been his ambition for many years.

The "Verbail" trap—as his friends have named his invention—is built very much like a bow. There is a strong but flexible spring-wire arch, with a piece of light chain attached to each end. The free end of each chain terminates in a ring, which slides freely around the opposite chain, thus forming an easily closing loop.

When the trap is set, a four-legged "spider" of light metal holds the loop open, wide enough to admit the foot of the animal to be caught. When the animal steps into the loop, the jointed legs of the "spider" let go and the spring flies apart, throwing the loop upward and at the same time pulling it shut—and the animal is caught.

The first reaction of a trapped animal always is to jump and pull. In an anchored steel trap, this always ends in a violent jerk, increasing the shock and pain of the jaws' first hard snap, and not unlikely breaking the animal's leg —if the steel trap has not already broken it.

In the "Verbail" trap, the effect is quite different. The chain cannot break the animal's leg, and its jump and tug are stopped by the "yielding resistance" of the spring that holds the chain. As a rule the animal, not being in any pain, soon accepts the situation philosophically and lies down to wait for what may happen next.

Animals with their legs broken in steel traps of the present pattern not infrequently pull and twist, despite the agony their efforts cause, until the foot is pulled off, and they escape. Once in a while a desperate wolf in a trap will even gnaw the broken leg free. But in