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### ACADEMICIANS WILL DISCUSS VITAL QUESTIONS

(By Science Service)

Washington, April .- The coming session of the National Academy of Sciences to be held at Washington, April 25-27, will be of unusual public interest because so many of the papers will deal with problems of human life. Dr. Simon Flexner, Director of Laboratories in the Rockefeller Institute for Medical Research, will deal with epidemics from the experimental side.

Dr. Charles B. Davenport, Director of the Station for Experimental Evolution at Cold Springs Harbor, Long Island, will consider the probable limits of the present growth of population.

Dr. Jacques Loeb, head of the department of experimental biology at the Rockefeller Institute, will present the results of two years of investigation of the physical and chemical behavior of proteins.

Professor E. N. Thorndike of Columbia University will show how the method of mental tests, hitherto used mostly in detecting the feeble-minded, may be extended to distinguish the higher grades of human intelligence.

Professor Raymond Pearl of Johns Hopkins University will present a paper on the "Specific Forces of Mortality".

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### WORLD CONFERENCE TO STUDY ATOM STRUCTURE

(By Science Service)

Washington, April .- The question of what goes on inside of an atom is to be discussed at a special conference of physicists called by the Solway International Institute at Brussels this month. Prof. R. A. Millikan of the University of Chicago and vice-chairman of the National Research Council has been invited to go to Brussels at the expense of the Institute as a representative of American science. Professor Millikan devised a new method for catching and counting the individual electrons, which weigh less than a thousandth part of the hydrogen atom and are expelled from radium with almost the speed of light

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## TURN CULL ORANGES AND LEMONS INTO MARMALADE AND VINEGAR

(By Science Service)

Los Angeles, Cal., April .- Showing the citrus growers of California how to make candy, chemicals, marmalade and vinegar out of the lemons, oranges and grapefruit that were formerly wasted has been the job of the Citrus By-Products Laboratory of the U. S. Department of Agriculture here.

In the laboratory, with test-tube and beaker, the chemist has worked out processes that have established a new industry here.

Commercial concerns using processes worked out in the experimental laboratory are producing lemon oil, citrate of lime and citric acid from lemons. Other concerns are producing orange by-products to exceed 6,000,000 pounds each year. These include marmalade, marmalade stock, jellies and candied peel. Improved methods for the manufacture of orange vinegar have been developed. Methods for the utilization of cull grapefruit in candied peel and juices of excellent quality have been devised and existing methods for the manufacture of citrate of lime and citric acid have been improved and adapted to California conditions.

Until the laboratory was established, the problem of how to utilize economically the cull and waste fruit was becoming more acute each year with the development of the large orange and lemon groves of California and Florida. Fruit which is too small or too large, unsightly or misshapen, cannot be sold profitably for food. Some fruit is not fit for shipment because of minor defects, such as small bruises or punctures from thorns; gravel or rough boxes. Such defects become points of infection which cause decay. But if utilized before decay sets in perfectly good products may be made from them.

## SNOW STORMS IN ENGINE CAUSE AIRPLANE CRASHES

(By Science Service)

Washington, April .- A snowstorm in a racing airplane engine may cause it to stall and crash plane and aviator to earth, it has been discovered during experimental work in the automotive power plant tests at the National Bureau of Standards here.

Even when the temperature is that of a comfortable room, 68 degrees, engineers have seen the snow fall inside and clog the fuel and air intake of the engine.

"This may explain the cause of some of those accidents that occur and cannot be explained by some definite defect, such as a break in the fuel line or a collapse wing," declares Stanwood W. Sparrow in a report of the National Advisory Committee on Aeronautics.

The intruding air, carrying as much moisture as the outside air, expands as soon as it comes into the manifold. This causes the temperature of the air to drop, and the colder air finds that it cannot keep hold of the water it has been carrying. It lets go of it and there is a regular snowstorm that delays fuel traffic and causes a shutdown in the power factory of the airplane.

"When these conditions occur while flying, there are great fluctuations in power," explains Mr. Sparrow. "Then a pilot is in exactly the same position as though his engine were controlled by a lunatic opening and closing the throttle at will. Yet, in case of an accident, before an examination could be made, the snow would have melted and no evidence would have been left to confirm the pilot's report of trouble".

Methods are being devised to provide heated air that will make it summer all the time at the throttle of the engine.



DETECTIVE - CHEMIST EXPLAINS  
HOLE IN TABLECLOTH

(By Science Service)

Boston, April .- A curious bit of scientific detective work came to light here in the address of Miss Alice L. Wakefield of the Mellon Institute before the annual convention of the Massachusetts Laundry-Owners Association. Miss Wakefield described how there came into her laboratory in Pittsburgh a fine tablecloth in which a hole had developed during the process of laundering. The question was, why the hole? Was responsibility to be placed on the laundry, on the maker of the fabric, or on someone else?

Miss Wakefield noticed that near the hole were three small spots, apparently ink stains, one of which was several shades lighter than the other two. This gave her a clue. Carefully cutting out a little piece of the cloth carrying the lighter colored stain, she subjected it to chemical analysis. The results were conclusive. It was an ink stain, and someone had tried to remove it -- but he had used the wrong kind of eradicator.

It seems that there are two kinds of writing ink. One kind contains aniline dyes, and stains from this kind can be removed with the ordinary two-fluid eradicator, the chemical basis of which is chlorine. The other kind of ink contains iron salts, and this kind the chlorine eradicator will not remove, though another chemical, oxalic acid, will do so. The crime which Miss Wakefield was investigating proved to have been begun by a stain with the iron-salt ink. Then the culprit, or an accessory after the fact, tried to remove the evidence with the wrong kind of eradicator, namely the kind containing chlorine. The ink stain wasn't bothered much, but the cloth was. In the effort to make the eradicator work where it never was intended to, probably too much of it was used. The cloth was weakened and when it was rubbed in washing it gave way.

The moral, say the laundryowners, is, don't try to take out ink-spots unless you know what you are about.

CHILEAN STRAWBERRY  
ARRIVED VIA EUROPE

(By Science Service)

Washington, April .- At this season of the year when we greet the return of the strawberry to our table it is interesting to be reminded that our North American cultivated varieties are all descendants of a Chilean plant. W. P. Montgomery of the Pan American Union tells its history as follows:

About two hundred years ago a French mariner, Captain Frezier, brought the Chilean strawberry from the southernmost republic of the Western Hemisphere to Marseilles, France. A few years thereafter specimens of this plant were imported into England from the Continent, and later found their way from Great Britain into the United States. The strawberries now cultivated generally in North America, both commercially and as a garden product, are lineal descendants of the Chilean strawberry, fragaria Chilensis, carried to Europe in the XVII century.

As early as 1624 the North American strawberry, fragaria Virginiana, was sent to France to the gardeners of the king, and was tilled with the utmost care in order to supply a new delicacy for the table of Louis XIII. Its cultivation did not become general nor did it improve the size and quality of the fruit. After the arrival of the Chilean variety in France strawberry culture became popular and developed into a garden and commercial industry of considerable importance.

The principal modification which the Chilean strawberry has undergone in the United States has been with the object of improving pollination by a slight admixture of fragaria Virginiana, or Virginia strawberry, which grows wild in great profusion throughout the Mississippi Valley and in the North and South Atlantic States. The Chilean strawberry has been cultivated commercially in the United States for about seventy years and has become the most important of the small fruit crops of North America.



## ARE PHYSICIANS LESS INTELLIGENT THAN ENGINEERS?

(By Science Service)

Washington, April .- During the war it was reported that medical officers made lower grades in the army examination for mental alertness than did the engineers. This, naturally enough, irritated the physicians and flattered the engineers. But many in both camps wondered whether it could be true, and if so, why.

✓ The National Research Council has just published a report by Dr. R. M. Yerkes on the intellectual and educational status of the medical profession in the United States Army which throws new and interesting light on the question.

Army doctors, according to the report, are on the average less alert mentally than are engineers. There seem to be two principal reasons for this: (1) medical officers are considerable older and therefore somewhat slower than engineers; (2) they were not selected for military appointment on the basis of rigorous training and examinations in officers' training camps, as were many of the officers of the Engineer Corps.

The surprising fact is pointed out that physicians, engineers and chaplains in the United States Army differ greatly not only in degree of mental alertness but also in the kind or quality of their intelligence.

In a familiar army test called "Opposites," which demands that the person who is being examined promptly give the opposite for each word presented to him, the doctors did well, the engineers poorly and the chaplains exceptionally well. In another test called "number series completion," the name of which will bring unpleasant memories to thousands of young Americans who took the army intelligence examination - the doctors and chaplains did rather poorly and the engineers remarkably well.

"These facts may mean either that men are naturally better fitted by their particular kind of intelligence for one profession or for another, or that their minds are changed by their professional training and experience," concludes Dr. Yerkes. "Perhaps, after all, persons who choose medicine as a life work have different sorts of minds from those who naturally take to engineering or to preaching. If this turns out to be the case, it may some time help greatly in the selection of a vocation."

## TEST FIRES TELL VALUE OF WALLS

(By Science Service)

Washington, April .- Building a fire and seeing just how much damage it can do is just an incident in the day's work of the fire resistance engineer. Ordinarily fire engines stop the flames when they become most interesting and spectacular, so the investigators at the National Bureau of Standards are building sections of walls and partitions to see how they would act in actual fires.

Burning oil and compressed air playing on one side of an eight-inch wall of common red clay brick gave the high temperature of 2100 degrees Fahrenheit during the latest test, conducted by H. S. Ingberg. On the other side there might have been waste paper or the baby's crib, for the temperature was only 295 degrees, not hot enough to make ordinary combustible materials burst into flame. During the six hour test, those eight inches of brick successfully kept out the fire.

In the special fire test furnace at the Bureau of Standards, all sorts of materials, made into walls or partitions, are being exposed to intense heat under controlled conditions. Thermocouples, electrical substitutes for ordinary thermometers, are used to measure accurately the temperatures at different parts of the walls, and there are openings through which the engineers can watch the progress of the fire.



**WORLD CLIMATE TOLD  
BY NEW SCIENCE**

(By science Service)

Washington, April . . . By means of charts and tables, and by determining when certain plants burst into leaf and flower, the scientists can now tell the proper time to sow wheat, what date will see the hawthorn of England in bloom, and whether a certain plant or animal will flourish if transplanted from a particular place in one country to a favorable locality in another.

This new science of bioclimatics promises to be the governing guide of the future entomologist, botanist, and agriculturist, according to Dr. Andrew D. Hopkins of the Department of Agriculture.

Some of the ideas about climate that we learned from our geographies are wrong. The temperate zone is not a strip of the earth's surface running straight around with the parallels of latitude. Instead, it runs in a north-westward direction from the eastern to the western coast of a continent. The scientist finds that Seattle, Washington, in about latitude 48 degrees north, has a climate more like Washington, D.C., in latitude 39 degrees, than that of northern Newfoundland in latitude 48 degrees. Moreover, on the high mountains of the tropics all of the zones of climate, ranging from equatorial to that of the frigid north, may occur.

No wireless is needed to tell Dr. Hopkins when spring arrives in Eurasia. Sitting in his office, using the data that have been collected and the scheme he has evolved since his first work on the subject in 1895, he can make preliminary predictions with as great accuracy as is often had in actual observations, as to the date for a given season or average of seasons that leaves and flowers will appear in certain plants, when to plant crops and when they will be ready for harvest, or when to spray for a particular insect at any place on the two great continents of the world. All that is needed is the recorded date of the event or an equivalent event at Karawha Farms, near Parkersburg, W. Va., where Dr. Hopkins has done most of his work, and which has been adopted as the international base station of the system of bioclimatic studies and predictions for North America.

By this method it is found that spring is, on a 4 year average, 44 days earlier in western Europe than in eastern America. The address related particularly to preliminary results incident to the greater task of determining the application of the bioclimatic law in making predictions as to the natural and artificial distribution of plants and animals of the world as a whole.

The latest achievement of the new science which is being developed through Dr. Hopkins' studies is the prediction of the annual July and January temperature for over 600 meteorological stations in the United States with an accuracy that surprised even those who were most interested.

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**AMERICANS BUILD WORLD'S  
LARGEST WIRELESS IN CHINA**

(By Science Service)

Washington, April . . . The largest wireless station in the world will be erected at Shanghai, China, by an American concern, according to an announcement of the Bureau of Foreign and Domestic Commerce. Six masts, each a thousand feet high, will be erected, and when completed the station will be able to transmit and receive messages across the Pacific without the necessity of relay.

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Rust is called the flameless fire.

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Waterproofing materials for stone are now being tested by the National Bureau of Standards.

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There is little difference between the strength of the Southern pines and that of Douglas fir from the Pacific northwest.

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Live-stock grazing is an important factor in forest-fire protection.

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American corn and the tropical coconut grow side by side in the Philippines.

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Waterfowl, under the protection of Federal laws, are increasing in number.

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Sweet clover cured in the sun contains more protein than that cured in the shade.

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Lead and zinc are absorbed by the soil near the mines and poison the plants, making the land unproductive.

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Waste molasses forms an effective fertilizer for young sugar cane.

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Annual deposits from the air above industrial centers are about 90 tons per square kilometer.

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Formations in San Juan County, New Mexico, contain 10,000,000,000 tons of coal in workable beds at depths of less than 1000 feet beneath the surface, according to the U.S. Geological Survey. Poor shipping facilities and competition now prevent its use.

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California's output of magnesite is calcined and used as a cement, while practically all the magnesite mined in Washington is dead-burned into synthetic ferromagnesite and used as a refractory lining of furnaces and smelters.

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A fly parasite which preys upon potato beetles has been found in the upper Michigan.



"Take-all", a new wheat disease, is said to be very destructive to wheat in Illinois and elsewhere in the Middle West. It is supposed to have been introduced by the planting of Australian wheat imported for food purposes.

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Ant-guards, flower vases and holy-water urns have been found to be breeding places for yellow-fever mosquitoes, but the danger can be overcome by putting a lump of camphor in the water.

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Electric welding now used in vehicle building and ship construction is now used to fasten together steel frames of buildings in England.

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Instead of molding concrete roads in place, pre-cast slabs are being used in some cases both here and abroad.

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Milk powder is exported from Argentine to Italy to be used in making cheese.

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An English mason laid 1555 bricks per day for 18 days.

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30 miles of subway are being built in Tokio.

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TNT as a blasting explosive is not detonated by bullet shock from a high-power rifle.

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Most fish that are shipped now are frozen a few hours after they are caught, and the housewife who buys them when they are still frozen gets meat superior to that of fresh fish shipped in ice.

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Australia has invited tenders from American business men for steel poles and copper cable.