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THE CALIFORNIA REFERENDUM ON THE LIMITATION OF MEDICAL RESEARCH

THE lives of millions of men, women and children now and in the years to come? Or the lives of a few dogs and other animals? Which will you save? This question, along with the "funny money" $30 every Thursday plan and over a score of other referendum propositions, will come before California voters on November 8.

The proposed antivivisection legislation, masquerading as a "humane pound law," would plunge a knife into scientific research in California universities, laboratories and other institutions. It would throttle medical inquiries into the causes and cures of disease.

It is quite possible that those who vote for this restrictive legislation will be signing their own death warrants. For in California, as in other parts of the world, bands of scientists are working valiantly to conquer diseases not yet controllable or fully understood. They must have animals upon which to experiment, just as others before them have with the help of animals discovered the way to cure, control and prevent so many ills of mankind.

Loving his "man's most faithful companion," the misled or misinformed California voter for the proposed "regulation of pounds" act may very well be endangering the health of his dog. For veterinarians use scientific medicine in keeping well or curing pets and other animals.

Repeatedly in recent years the scientists, who have little enough time as it is for their investigations, have been forced to come out of their laboratories to fight for the right to continue the sort of animal experimentation that made possible modern surgery and the control of such diseases as diphtheria, smallpox, syphilis, diabetes and other ills that once raged unchecked. Emotional ladies, with the help of well-paid publicity experts, insistently plague legislative bodies with demands for what they call "antivivisection" legislation. Despite long campaigns they have been generally unsuccessful.

The California "humane pound" act represents a change of tactics. An attempt to mislead the public into approving antivivisection referendum legislation through an indirect attack is being made. The proposed act upon casual reading may appear to be innocuous, but lawyers find jokers in it. Any one collecting animals for any purpose except for sale as pets becomes a "poundmaster" and any such person would be prevented from allowing any domestic animal to be used for experimental purposes. Animals for experimental or demonstration purposes would have to be bred *en masse* on the very premises of medical institutions. As this is quite impracticable, the effect would be to prevent animal experimentation on any useful scale. Moreover, such a law would open the way for persecution of medical institutions and scientists through a constant inquisition by the antivivisectionists.

Nation-wide opposition to the proposed California legislation has developed in lay, scientific and medical circles. Leading churchmen, scientists and others are advising the California electorate to defeat this referendum proposal as they did a similar attempt in 1922. In California the California Society for the Promotion of Medical Research in opposing the measure has the backing of foremost educators, professional and lay men and women, as well as scores of scientific societies.

The mis-named "humane pound" act is called by its opponents "an intelligence test for the people of California." The antivivisectionists weigh stray dogs against babies, it is charged, and if the measure becomes law, the babies will lose. One slogan of the scientists is: "If you do not kill this measure, it may kill you!"

—WATSON DAVIS.

THE CHEMICAL INDUSTRIES OF CZECHOSLOVAKIA

THE German Reich has received the major part of Czechoslovakia's chemical industry, as a result of recent territorial shifts, according to the German correspondent of *Industrial and Engineering Chemistry*.

Control of the Sudeten area, it is shown, gives Germany a region which is highly industrial and—before the World War—was the most densely industrially populated area of all Europe. The chief plant of Czechoslovakia's major chemical combine is already under German control. This organization, Verein für Chemische und Metallurgische Produktion, produced more than 60 per cent. of the Czechs's chemical values in 1937. The historic radium mines at St. Joachimstal, from which the Curies received the ore out of which they isolated and discovered radium, is another prize.

While the chemical plants which Germany will now control are in good shape, many of the industries which are secondary consumers of chemicals are rather run down. These factories, originally built in the last century, are located in long strings in the narrow valleys which penetrate into the Sudeten mountain range. In those early days they utilized the water power of swift-flowing mountain streams.

While these plants have a difficult transportation problem, the situation is balanced, somewhat, by the presence of highly skilled labor, trained for generations in the making of precision instruments, laces, textiles and glass-blowing.

While acquiring control of Czech chemical plants, the gain raises problems for the German Reich to solve. Last year Czechoslovakia imported 47 per cent. of its chemicals from Germany as contrasted with only 8 per cent. from the United States. Czechoslovakia's chemical exports to Germany were only one tenth of the imports from Germany. Thus the two industries supplement each other, to some degree. However, many of the old Czech chemical plants will need extensive modernization if they are to compete with the great German chemical plants without their former protection of a tariff wall.

Not to be overlooked is the fact that many of the Czech chemical companies have interests in Yugoslavia,

Roumania, Hungary and Poland so that Germany's economic penetration of these countries will be advanced.

HOW THE HEART LIVES

AT the Conference on Electrophoresis of the New York Academy of Sciences, on October 28, new, fundamental knowledge of how heart tissue eats its food, grows and creates energy to keep on pumping was described by Dr. Kurt G. Stern, of the Yale Laboratory of Physiological Chemistry. With the aid of a new type of Swedish apparatus, Dr. Stern, with Drs. M. K. Horwitt and G. J. Scheff, has been tracking down the secrets of how enzymes in heart muscles control respiration and burn up food to go on living.

By chemical extraction the Yale researchers have obtained solutions from heart muscle which have potent biological activity on respiration. Formerly thought to be a mixture of insoluble enzymes and muscle tissue, these solutions have now been shown to consist of supergiant protein particles of uniform size. Some of them have a molecular weight of over 100,000,000, by far the largest molecular particle yet isolated by science. Air-driven ultracentrifuges were employed in the isolation and in the study of the size of these molecules. In some of their physical properties they resemble the virus proteins isolated by Stanley and Wyckoff, although the respiratory particles are larger.

Not only are the particles huge but they carry on their surface, suggests Dr. Stern, a fabric of colored, active groups knitted together in such a fashion that the path of oxygen and hydrogen in the combustion of foodstuffs in the cell is rigidly determined by the manner in which these surface groups are arranged. The active groups may be studied with a spectroscope. Thus, in effect, the way muscle tissue eats its food is probably along certain atomic paths, or streets, on the surface of the respiration-controlling particles.

One kind of apparatus used in this work acts like a sorting machine for the separation of heavy molecules in solution. It is sometimes impossible to separate such solutions by whirling them in a centrifuge. Invented by Professor A. Tiselius, of the University of Upsala, Sweden, the apparatus takes advantage of the different electrical charges which protein particles possess to effect the separation. By placing a solution of such particles between electrodes and applying an electrical voltage a migration of the particles begins, those with the greatest charge moving the faster.

INSECT DAMAGE TO TREES AS CONSEQUENCE OF THE NEW ENGLAND HURRICANE

NEW ENGLAND'S great hurricane will still be doing major damage next summer and for many seasons to come, warned Drs. E. P. Felt and S. W. Bromley, of the Bartlett Tree Research Laboratories, in a paper presented before the fifteenth Conference of Entomologists meeting in New Haven.

By weakening trees and exposing many new points of invasion, the storm has made them more susceptible to insect attack, it was pointed out. Of particular importance is the possibility of further spread of the Dutch elm disease, the fungus of which is carried by the European elm bark beetle. Dr. Felt stressed the necessity for burning all broken elm branches, or at least their bark, before the end of March.

Breakage in branches, and especially in roots, has weakened trees of many species, so that such insects as chestnut borer, bronze birch borer, long-horned borers and flat-headed borers will have things made much easier for them. Near the coast, salt spray damaged pine foliage, which will be dead next year, and the weakened trees will fall easy victims to trunk and root weevils.

Another source of damage is expected in cities, where considerable parts of the street elm populations were broken down. The survivors will be subjected to the concentrated attacks of hordes of elm leaf beetles, robbed by the wind of their once numerous sources of food.

That these forebodings are more than theory is witnessed by the fact that when a hurricane sweeps over forests in the South, it is followed by a flare-up of insect damage.

HEAT AND HUMIDITY IN FACTORY CONDITIONS

IN special "hot rooms" in a laboratory at the U. S. Bureau of Mines at Pittsburgh, scientists are finding out the facts about the crucial "danger zone" of temperature and humidity where workers in industry are at the border line of heat stroke and prostration.

Under direction of the reasearch committee of the American Society of Heating and Ventilating Engineers, studies are disclosing that injuries to health begin to occur when work is carried out at a temperature of 90.5 degrees Fahrenheit and a humidity of 90 per cent.

The tremendous toll which heat and humidity take among factory workers, especially in the South during the summer, should be lessened by the findings of the engineers' laboratory. No exact financial determination has ever been made of the economic loss involved but estimates place it at hundreds of millions of dollars annually in lost time and impaired efficiency.

At the critical condition of 90.5 degrees Fahrenheit and 90 per cent. humidity, it has been found that a worker's pulse rate accelerates 15 beats per hour of exposure. The body temperature rises at the rate of nearly a degree per hour and the body loses weight at the rate of two pounds per hour. The blood count shows the presence of 50 per cent. more white blood corpuscles. These findings are for light exercise. For heavy labor the "break down" point would be reached much sooner.

The experimental data obtained in the study will form the basis for a better understanding of industrial air-conditioning problems in certain industries and aid in the establishment of codes and practices governing a more intelligent regulation of working conditions in the interests of management and labor alike.

A NEW SYNTHETIC FIBER

CHEMISTRY has created a new synthetic fiber from coal, water and air, which has the strength of steel coupled with the fineness and beauty of silk, it is announced by the E. I. du Pont de Nemours and Company.

The new fiber, claimed to be one of the greatest achievements of industrial research, is expected to be the rival of natural silk in its last remaining stronghold of usefulness—the hosiery trade. Nylon is the new material from which the new fiber is made. It is basically different from familiar rayon in that it does not require cellulose for its production.

The new fiber is the work of many chemists, but patents for its production are in the name of the late Dr. W. H. Carothers, du Pont chemist. Basic Carothers patent is No. 2,130,948 with 56 broad claims which disclose eight specific ways of creating the fibers.

Chemically the nylon fibers are polyamides. Like natural silk they have a protein-like structure. Filaments finer than silk or rayon can be spun. The filaments have amazing elastic recovery and great strength. These properties, plus the ability of the fibers to take common dyes easily, forecast the chemists' goal of making sheer, two-thread hosiery with the wearing characteristics of the four-thread, service-weight variety.

But hosiery is not the only application of the new nylon fiber. Because its diameter can be controlled at will it can be produced for a variety of products like brush bristles, racquet strings, fishing lines, woven dress goods, velvets, knitted and woven underwear. It can also be employed as a transparent wrapping film, for plastic compositions, textile finishing agents and coated fabrics. Toothbrushes with the synthetic bristles are already on the market.

Construction of an $8,000,000 plant at Seaford, Del., for the production of the fiber will start in December. Production from this plant will probably start in about a year.

ITEMS

A MASTODON, whose skeleton includes both the largest and smallest mastodon bones ever found, was placed on view on October 28 at the official opening of the new Hall of Geology and Paleontology and the Bennett Alcove of Geology in the Hall of the Niagara Frontier of the Buffalo Science Museum. Containing the 12½ foot tusk, the largest mastodon bone, and an eight and a half inch hyoid bone, the smallest, the group shows the excavation where the skeleton, which dates back only to 1500 B.C., was found in 1930. Not quite so large as a circus elephant, the mastodon nevertheless had bigger tusks and like the elephant, a tough hide. Its hide, however, was covered with a heavy coat of hair.

A SOLAR heater, which absorbs heat from the sun's radiation and puts it to use for cooking and similar purposes has been patented by Dr. C. G. Abbot, secretary of the Smithsonian Institution. The sun's rays are caught by the apparatus, which uses the sun's energy to heat oil. The oil in its turn heats an oven, a boiler or whatever device desired. Dr. Abbot's invention is covered by Patent No. 2,133,649. He has been active in research seeking to utilize the sun as a source of power for many years.

THE *DC-4*, world's largest landplane, which has just completed its manufacturer's trials, is back at the factory. But nothing's wrong with it—workmen are only taking out four and a half tons of test equipment and putting in fittings that will make it fit for the most discriminating passenger. Seats and berths that will make space for forty-two passengers by day and thirty-two by night as well as knick knacks that go with the accommodations are being installed. So is soundproofing; engineers don't mind the noise, but the passengers do. Among the items listed in the huge craft's equipment is a curling iron in the ladies' dressing room. The plane has been built to the order of America's five leading airlines. It will go to them in turn for 60 days of trials before production of regular models begins.

WHEN you get angry or experience some other emotion, it shows up in your brain waves, the record of electrical activity in the brain, according to a report by Dr. Hudson Hoagland, of Clark University, to the Academy of Physical Medicine. Brain waves from normal persons do not show as much variation under emotional stimulus as brain waves of mentally sick patients. The studies suggest the emotion does not originate in the cortex of the brain.

ANIMALS that live in the sea are not always free to swim the sea whithersoever they will. Submarine heights and depths, wide stretches of inhospitable water, may be as great barriers to sea life as mountains, canyons and deserts are to life on land. But sea creatures unable to make far journeys under their own power may "get there just the same" by clinging to drifting trees, logs and other chance-made rafts, according to Dr. Paul Bartsch, of the U. S. National Museum. His results are described in a new publication on the marine mollusks of Hawaii, written jointly with Drs. William H. Dall and H. A. Rehder, also of the National Museum staff, and published by the Bishop Museum of Honolulu. Dr. Bartsch is convinced that Hawaii's sub-shore mollusks reached the island by such drifting voyages.

THE rushing streams of Great Smoky Mountains National Park will soon have quiet pools introduced into their courses, here and there, by colonies of beaver which the U. S. National Park Service plans to introduce. Although the animals themselves will be strictly protected against hunters, they are expected to be of indirect benefit to fishermen, because their ponds provide shelter and grow food for fish. Beaver were abundant in the Great Smokies region many years ago, but early settlers trapped them all out, as they did in many other parts of the country. Where beaver receive reasonable protection they multiply rapidly. Their dams have come to be recognized as material aids in the fight against soil erosion.

WITHOUT even waiting for the much-discussed mechanical picker, cotton raising is becoming mechanized, a study conducted by the Works Progress Administration discloses. Tractors, feasible in fields on level or gently rolling terrain, are doing the trick. In the thirty-year period from 1907 to 1936 the labor requirements of cotton production declined by 16 per cent. per acre and 20 per cent. per bale. The greatest declines in labor costs were noted in the western cotton-producing areas, from the Mississippi Delta on out to southern California.