SCIENCE NEWS-LETTER



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SCIENCE SERVICE

1701 MASSACHUSETTS AVENUE TELEPHONE, MAIN 2615 WASHINGTON, D. C. EDWIN E. SLOSSON, EDITOR HOWARD D. WHEELER, MANAGER

No. 51

Edited by Watson Davis

March 20, 1922

MODEL ROAD BUILT TO BE DESTROYED

Springfield, III. Thirteen miles from here there is a two mile model read that has never been used. This week (ending March 25) tests will be begun that will bring about the destruction of the concrete, brick and bituminous pavements that have been built into various sections of the tract. Auto trucks will race over the Bates experimental read for months to give the highway engineers of the country information on the actual comparative value of the various types of read new being built.

Simty-three kinds of construction, differing in kind of material, or method of design, or construction, are used in the test read. Each type of construction is made in varying thicknesses ranging from these obviously too thin to these overstrong, and it is planned to increase the weight of the trucks as the test progresses. Over twenty engineers will constantly observe with automatic machines the deflection and other effects of the premeditated and regulated traffic.

The read has now seasoned two years and it is the first read designed and built for such a test. The Illinois State Highway Commission and the U. S. Bureau of Public Reads are cooperating in the large-scale testing venture. Voluminous test data were obtained during construction.

In 1919 heavy truck traffic caused the particl destruction of a well-built road in Illinois, Clifford Older, chief highway engineer of Illinois, explains. This failure lead to the construction of the model test road. Illinois has spent

over \$100,000,000 on highway construction and throughout the country many times that amount has or will be spent in the near future. The Bates read test will aid in scientific design of reads and will do much to eliminate doubtful "rule of thumb" methods, engineers believe.

BROADCASTS

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RADIO NETS OF THE WEEK

FARMAND CLUBS TO BRING OUTSIDE WORLD TO FARM HOMES

Washington. To join the ranks of club-member farmers of the younger generation, there is coming the Farmrader. He will prove a great help to his farmer father and he will bring the outside world to the farm home door-step.

"Farmrad" clubs, or, to say it uncontracted, farm radio clubs, are going to be another link in the demonstration work of the federal and state departments of agriculture. Following in the wake of pig, calf and canning clubs that now have over a million members, the radio clubs are empected to attract the interest of many more rural boys and girls.

The radio telephone is now bringing weather forecasts, crop conditions, and market quotations to many farms that are close enough to the present broadcasting stations of the U. S. Department of Agriculture or those of the cooperating states and private institutions. There are many millions of farms yet to be reached, and as the broadcasting is gradually extended to include the whole country, bright young boys and girls will be needed to convince their parents that a mysterious combination of wires and knobs will actually bring to the farm the vital information that will aid the complex business of farming.

Plans are under way for the extensive organization of Farmrad Clubs. County extension agents in many parts of the country are beginning to gather together small groups of local boys and girls at least twelve years of age, under the direction of a local leader.

In most cases, Farmraders will build their own radio receiving apparatus, using the instructions compiled by the Bureau of Standards and first made public through Science Service. Where funds permit they will improve this apparatus so as to receive from longer distances.

The Farmraders will become one of the chief informational sources of the community, once they are organized. The radiced reports will not only be turned over to their parents but they will be delivered to telephone exchanges and relayed to subscribers, posted on bulletin boards, and turned over to the local newspaper.

Home concerts and ontertainments via radio will be possible and will bring enjoyment to the farmers who have no movie around the corner. Well organized Farmrad clubs will undoubtedly be able to give radio entertainments at which public addresses and music are brought to the people of the community. 000000

Washington. Declaring that the assignment of radio waves for broadcasting made by the Radio Conference "do not appear to be nearly adequate for the proper development and expansion of public radio broadcasting in the interior of the country in the near future", W. A. Wheeler, in charge of the radio news service of the Department of Agriculture, member of the conference, is urging that additional wave lengths be allotted for government broadcasting which will benefit particularly the isolated rural population, some 32,000,000 people.

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In discussing the assignment of wave lengths from 1050 to 1500 meters representing a kilocycle frequency of 285 to 200 kilocycles per second for Government and public broadcasting, Mr. Wheeler declares, "If one assumes that a band of 10 kilocycles should be left for each service this makes possible only 8 or 9 services of this type in the same zone. This band is not exclusive and oven if made so it will be necessary entirely for Government broadcasting without considering the requirements of the so-called public services."

"A band of 700 to 750 meters wave length representing a frequency of 428 to 400 kilocycles per second is assigned for use 700 miles inland", he points out. "This will provide for a few services in the north-central portion of the United States bounded on the east, south and west approximately by Chicago, Kansas City and Denver. The value of this band is therefore limited to a few services in a very small part of the country."

While he recognizes the needs of the various mobile marine and aerial services in the protection of life and does not wish to encroach unnecessarily on any of these, Mr. Wheeler believes it is possible to assign a band of wave lengths below 1000 meters for public services that would come much more nearly getting at the needs of such services and not injure any of the services otherwise provided for.

"Some of the slightly longer wave lengths such as those in the band from 1050 to 1500 meters, may from a strictly engineering point of view for long range work be more desirable than some of the shorter waves", he says. "However, a large portion of the receiving equipment that is in the hands of the public at the present time is adapted only for short-wave reception. This fact must be recognized at least tem-

porarily and perhaps permanently. Also the point must not be overlooked that the number of kilocycles available is much greater in the shorter wave length bands than in the higher, and that for services within the ranges assigned to public service, that is, 250 mile radius the shorter wave lengths are very satisfactory."

FRENCH RAILROADS TRY RADIO TILEPHONE

Washington. Numerous disastrous accidents on French railways during the past two years, which have spread alarm among the travelling public, have caused French railway officials to experiment with radio telephone in communicating between moving trains and stations.

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In recent tests carried out by the Compagnic du Nord under direction of the French Ministry of Public Works, experimentors succeeded in transmitting orders from different points in the station at Bourget-Triage to the switching towers, up to a distance of over 400 yards. According to reports of the U.S. Consul at Bordeaux, portable apparatus used is described as consisting of an antenna in a frame,/commutator, a stick tipped with iron to place in the ground and a microphone, the total weight of which was fifteen pounds. Other experiments were made between places in the station and a train moving at a speed of mineteen miles per hour. The results were satisfactory as far as hearing the messages was concerned. They could be heard satisfactorily during the entire time the train remined in motion for a distance of over ten miles, irrespective of the speed of the train.

SIXTEEN VARIETIES OF EXPERTS GUARD PUBLIC HEALTH

Washington. There are sixteen kinds of public health workers that are called upon in some way or other to guard the public health. According to Prof. C. E. A. Winslow of the Yale School of Medicine, they are:

The physician, the nurse, the nutrition expert, the expert in physical training, the dentist, and the psychologist, who have to do with the human body and its functions.

The chemist, sanitary engineer, and the inspector, who are concerned with non-living environment of man.

The bacteriologist, the protozoologist, and the entomologist, who combat the parasitic enomies of man.

The sociologist and social worker, the statistician, the lawyor, and the expert in public health propaganda, who deal with the social environment of man.

SCIENCE OF GROWING THINGS

Agriculture News of the Week

PUNCHING INSTRUMENT TELLS WHEN PEARS ARE RIPE

Corvallis. • There need be no more guess-work as to when pears are ready to pick. An instrument has been devised at the Oregon Experiment Station here that will tell just when the pear fruit reaches the right stage of maturity for eating, canning, or for shipping to local or distant markets.

Ordinarily the man who has a lone pear tree in his back yard does not need to worry about the exact time when his pears should be picked, except to get ahead of his neighbors' children. By noting the color of the fruit and by testing it for softness and taste he can easily tell when it is ready for home use. But the grower of pears on a large scale has much more difficulty in deciding just when his pears should be picked. He must harvest them while they are still hard and green and he must know just how green or how hard they should be to attain the highest keeping and eating quality and reach the far distant market in perfect condition.

The apparatus that has been perfected measures the pressure required to punch shallow holes one-half inch in diameter in the flesh of the pear. Experts have worked out the correct pressures for the various varieties. Eartlett pears requiring forty pounds pressure to make the perforations are too green for picking but when they soften to such an extent that only thirty-five pounds pressure are required, they are ready for picking and for long-distance transportation. When the flesh reaches a condition that will not withstand twenty-five pounds pressure, they are beginning to soften too much for long-distance shipping and should be sent to a local market or canning factory.

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TURKEY VINDICATED ON GRAIN STEALING CHARGE

Fargo, N.D. - Charges of larceny commonly preferred against turkeys that range in grain fields may be definitely withdrawn following significant evidence that the homely birds choose one fat cricket to a whole field of grain during the season that they fit themselves for the Thanksgiving sacrifice. A count made last fall of the contents of a typical Tom's crop showed 240 grasshoppers, 50 black crickets, and 9 kernels of grain. Turkeydom rests its case on many similar evidences in other states. BUILD PLANT TO MAKE STEEL DIRECT FROM ORE

London. A plant for the production of steel direct from iron ore has just been completed and partly shipped to France from a large steel making and engineering firm of Sheffield, ancording to information reaching here. This plant is built to specifications of a French metallurgist, M. Basset, who believes he has at last solved the problem of eliminating the blast furnace in a manner that permits of economical steel production by the direct process.

The engineering firm, Edgar Allen & Co., have been under obligations to their French client to respect the secrecy of his discovery and they did this with such success that Sheffield ranained in complete ignorance of the work upon which the firm had been angeged for many months. The transportation of a part of the completed plant attracted a good deal of attention as under emisting conditions of Sheffield industry it is unusual for a train of twenty-nine cars, fifteen of them specially designed to receive their load, to leave a single firm's siding. Two powerful lecomotives were needed to move the mass of machinery. A prominent feature of the load was a desen or so cylinders, varying in diameter between ten feet and a helf feet in diameter, weighing eight tens each. This huge consignment represented the first installment, about one-third of the total, of the plant that is to be erected in France for the production of the steel by K. Basset's new process.

It is understood that the basic principle of the process is somewhat akin to the rotary kiln of a coment works. Into revolving cylinders some 200 feet long the ore is projected and as it traverses the length of the cylinders it will be fired with pulverized coal. The cylinders will, of course, have refractory linings, and when working will weigh about 400 tens each.

Engineers consider it ironical that Sheffield, the home of the center of the steel trade of the world, should have been entrusted with the construction of a plant which aims at revolutionizing modern steel making and which may eventually cause the scrapping of present-day plants.

PREHISTORIC PANANA CAMAL PROVED BY COMPARISON OF PACIFIC AND ATLANTIC FISHES

Washington. A recently completed study of a large collection of marine fishes collected on both the Atlantic and Pacific shores of Panama before the canal was dug indicates guite conclusively that in comparatively recent geologic

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time there was a passageway from ocean to ocean where the isthrus now stands. Of 640 different species of fishes taken in the investigation, 72 were found on both sides the narrow strip of land.

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Many of the fishes on both sides of the isthmus which are considered scientifically distinct are nevertheless very closely related and doubtless have been derived from common ancestral species. The modifications in external appearance, habit, or anatomy which have been sufficient to cause them to be recognized by the systematist as different species, have probably resulted from the different manner of life each assumed after the throwing-up of the dividing land. On the Atlantic coast the bottom is deep and rocky while the Pacific shore is shallow and sandy. The adaptation of the fish to a new environment would be sufficient to cause the modifications noted in the closely related species.

While the commercial fisheries of Panama are insignificant at this time, there appears to be great possibilities for a profitable fisheries, particularly on the pacific coast. It is claimed that the people of the Isthmus are less wasteful of fishes than the people of the United States, as nearly all species of fish, including sharks and skates, are utilized as food.

SIX GOOD OPTIC MUSCLES FAIL TO PREVINT THE VACANT STARE

Washington. Continental Europe boasts of an owl of such stature and habit that it has been named the eagle-owl. The bird has an eye like an eagle and a look like an owl. The owl look is emphasized by the fact that the eyes of this natural field-pest destroyer have never been known to move during life. They cannot be moved after death.

The immovable eyeball of this giant owl has caused two German anatomists to examine the musculature of the organ with a view toward ascertaining the why of the steady scrutiny. But the vacant stare of the wise old owl still remains a secret except to the sophisticated bird. The anatomists found the usual six muscles that control the movements of the eyes of animals. The surmise is that from continued staring and resulting non-use the muscles have become functionless. The three pairs of muscles of the eagle-owl's eye, all in balance and immovable, suggest a locomotive's driving wheel on dead center.

EUGENICS AND ITS EFFECT ON

THE FUTURE AMERICAN COLDOLIVEALTH

By Dr. Levellys F. Barker, Medical Dopartment, Johns Hopkins Hespital.

(Leading sanitarians of the country have just completed a conference on the future of health in the United States held in Washington. The improvement of our future generations, before and not after they are born, was one of the important subjects discussed at the conference. Dr. Barker explains the public health view of eugenics.)

The eugenic problem, perhaps the most difficult and perploxing of all, has, as yet, been scarcely touched by public health workers. Senitary science, bactoriology, opidemiology, personal hygiene, medicine and surgery, modern nursing, and social service are improving the environment, preventing disease or recognizing it early and arresting it, prolonging life and ameliorating the conditions of life of individuals; but what are they doing to the race? May they not be causing racial deterioration through survival of persons who transmit inferior gorm plasm. As environmental improvement keeps alive the biologically "less fit", should we not see to it that arrangements be made for the encouragement of parenthood by the "more fit", for the discouragement of parenthood by the "less fit" and for the prohibition of parenthood by the 'notoriously unfit'. Otherwise will not the inborn capacities of man undergo progressive decrease and contribute to racial extinction? If biologists are right about heredity, should we refuse to face the facts? Ought We not rather resolutely to face them, co-operating with Nature as we gain knowledge of her laws? These are some of the queries that biologists, and especially eugenists, are propounding. For these interrogators, eugenics would seem to be even more important than outhenics or environmental improvement for consideration by public health workers in the future commonwealth.

If the facts that we now possess concerning environmental influences on the one hand and heredity on the other could be systematically applied by public health workers there would result an enermous push upward both in the health of individuals and in germ-plasm betterment. And, of course, the main duty of public health administrators at a given time is to apply systematically for the premetion of health the knowledge that then actually exists. Legal enactments have their place in public health work and police power must be exercised for maintaining the order

that is conducive to public health; but these measures are far less important than others that are available, particularly the extension of educational policies, the improvement of social customs, the premulgation of better othical standards, and the encouragement of various forms of art; by which ideals of physical and moral beauty are determined, for these ideals are of great importance in influencing men and wemen in mate-selection.

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The facts should be told to the people in a way that will be understood by them and by persons who can convince them. For the masses, heredity and environment are still wrapped in mystery. Public health vorkers should be intermediaries between the scientist and the common mun. Matters hidden from him or misunderstood by him should be brought to light and carofully explained to him. Germ-plasms, fertilization, gestation, infency, growth, puberty, adelescence, maturity, ser-mating, parentheod, economic security, intellectual and emotional satisfaction, schility, disease and death are mong the subjects that require elucidation. The teachings of science must be especially prepared if they are to tempt the appetite and provide nourishment for the common man.

In discussing desirable sugenic goals -- and I may say that I am exceedingly skeptical of the possibility of any exhaustive practical augunic program until knowledge has been further increased and diffused -- it would be well to keep in mind the difficulty in arriving at decisions as to who are 'fit', who are 'fitter' and who are 'fittest' to survive, even though we arrived at a general agreement that certain groups are 'munifestly unfit' and should be denied the privilege of parenthood. Is it not desirable as yet, at any rate, to have many different races of man in the world and many varieties and degrees of inborn capacities in the individuals of a single race? Instead of attempting to breed people who are nearly clike, no matter how superior the type, might it not be wiser to encourage variation and to attempt to preserve as many worthy and pleasing varieties as possible, adapting the circumstances to them when necessary rather than forcing them into an unfavorable milicu. Think how far physics, chemistry, and mechanics would have to advance before machines could be devised that would take the place of the working men and women now engaged in various 'inferior' occupations. As knowledge grows and as social life becomes ever more complex, we shall need a greater variety of special aptitudes than ever before. There will be more rather than fewer kinds of services necessary in our social life, and it will be the task of vocational education to discover the particular kind of specialization to which each individual is most suited and to arrange for his proper articulation in the social machinery.

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NEWS OF THE SEARS

Brilliant Planets Shine in Evening Sky

By Isabel M. Lewis, of U. S. Maval Observatory.

After an absence of many months Venus has once more returned to the western evening sky and will be visible as an evening star throughout the spring and summer months and far into the fall. Though still close to the horizon at sunset and therefore not seen to advantage in March, this magnificent planet will rapidly improve its position for observation on each successive evening as it draws forther eastward and appears higher in the vestors sky at sunset. Its greatest distance east of the sun, called its greatest eastern elongation, will not be reached until September and it will not attain its greatest brilliancy until late in October. Even under the most unfavorable circumstances for observation Venus far surpasses all other stars and planets in brightness and when viewed under favorable conditions, as it will be for some months to come, it commands the admiration of even the most indifferent of star-gazers.

Saturn and Jupiter may now be seen rising in the eastern sky later in the evening. Both of these planets lie in the constellation of Virge just east of Lee, which is identified by its sickle-shaped group of stars. There is no difficulty about identifying Jupiter as it for outshines all other stellar objects in view at this time. Venus disappears below the vestern herizon before Jupiter comes into view. In a few months Jupiter will be rivalled and finally surpassed in brilliancy by Mars, a circumstance which only happens when Mars is in an unusually favorable position with respect to the earth, as it will be in June. As Mars is at present in the constellation of Scorpio, we must be up after midnight to see the ruddy plane' Mars will not be seen in the evening sky until May.

Jupitor and Saturn will be seen to the best advantage during March and April as Saturn comes into opposition to the sum on March 25 and Jupiter on April 4. On the dates of their opposition they will be visible throughout the night rising at sunset and setting at sunrise.

Saturn now lies a few degrees to the northwest of Jupiter and is far inferior to it in brightness. In fact, Saturn is surpassed in brightness by a number of the first-magnitude stars. Ruddy Arcturus appearing in the northeast is brighter than Saturn, while Sirius and Procyon, Rigel and Capella in the western sky, other stars including Castor and Pollux in Gemini, now near the meridian, and Regulus at the end of the handle of the Sickle in Leo, are not greatly inferior to Saturn in brightness.

The brilliancy of Saturn is also dimmed by comparison with the grandeur of nearby Jupiter. The steadily glowing radiance of Jupiter's golden rays can never be mistaken for the light of any other stellar object and is in strong contrast to the twinkling lights of the many bright stars that are visible at this time. With the aid of a good field glass one should also be able to glimpse at this time some or all of the four historic moons of Jupiter that were the first objects to be discovered by Galileo with his "optik tube" or first crude telescope.

ECLIPSE OF SUN VISIBLE MARCH 28

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On March 28 there will occur an annular eclipse of the sun visible as a very small partial oclipse in Florida for a short time after sunrise. The northern limit of the shadow passes along the Gulf Coast from New Orleans through the extreme southorn part of Mississippi and Alabama to the southern part of Georgia and the Atlantic Coast. Along this line no oclipse will be visible as the moon will just graze the sun's limb but directly south of this line a small partial phase will be seen. In Florida the partial phase will last for about one hour after sunrise, the sun rising partially eclipsed.

In Central America and the West Indies a small partial collipse will be visible at sunrise or shortly after.

The central line of the eclipse, which is about 150 miles wide, passes from Peru across Brazil and the South Atlantic to Africa at Bathurst. From there it crosses the Sahara Desert to Egypt and Arabia and ends at sunset at the Persian Gulf. Along this path, at the maximum phase of the eclipse, an annulus or ring of solar light will be seen around the dark lumar disk. This type of eclipse occurs whenever the apex of the shadow cone falls short of the earth's surface.

An annular oclipse has small scientific value owing to the presence of the ring of solar light which prevents the appearance of the solar corona and other phononene that accompany total oclipses of the sun. An annular oclipse is a unique and beautiful spectacle to observe, however, and the duration is considerably longer than that of a total oclipse. In the coming oclipse the annulus will be visible for seven minutes, fifty seconds at the maximum.

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DO YOU KNOW THAT -

The new Gilboa reservoir on the headwater of the Schoharic river in the Catskills, which is being built to supplement New York City's Catshill water supply, Will have an area of 1170 acres.

An average of one-fifth of a ton of garbage per capita can be expected from a large community.

A device consisting of a filter that removes all the dust in the air and records the amount by the blackness of the deposit on the paper has been invented in England.

Most of the platinum produced in the United States is recovered as a secondary mineral from placer operations and from the electrolytic refining of gold bullion and blister copper.

DO YOU KNOW THAT -

Most onion growers obtain their seed from the Canary Islands; large quantities of seed are also obtained from California.

In 1900 thirty-two different shades of green were used incsignal glasses on American railways. Now all have standardized on one huc.

The melting point of tungsten is about 3350 degrees centigrade, higher than that of any other known metal.

Scapstone has been quarried for centuries by natives of India, China, Brazil and other foreign countries for the manufacture of crude utensils such as bowls, pots, etc. In the United States Indians used to quarry scapstone and from it fashion various utensils. In later years deposits have been worked in many states to obtain scapstone for local use for foot warmers, fireplace lining, etc.

DO YOU KNOW THAT -

A speed of 312 miles an hour is the remarkable claim for the Hansch Holicopter, of which the British Air Ministry has received news through unofficial circles.

In England there is a distinct movement toward the use of ready-propared dishes, Which helps the canned-goods trade. This movement is due to the difficulty of socuring domestic help and the high wages demanded. In France, however, where help is more abundant and where cooking is carried to a state of artistic perfection readycooked foods are little used.

Alcohol is extensively used by taxicabs of Havana for fuel.

Experiments at Kentville, N.S., with potatoes, oats, and hay to determine the influence of fertilizers and lime showed that liming increased all three crops whether unfertilized, manured and fertilized, or manured and not fertilized.

DO YOU KNOW THAT -

Before the establishment of the British protectorate in 1787, Kisi Country, Sierra Leone, West Africa, used roctangular twisted coins made of wrought iron.

The Underwriters Laboratories of Chicago in cooperation with the Mational Aircraft Underwriters Association has opened registers of aircraft pilots and of aircraft.

A marine engine burning heavy bil produces the same power at a lower cost than one burning gasolene, tests at the University of Washington show.

There has been a considerable falling off in meat production in the United States since the war record of 1918, when about $17\frac{1}{2}$ billion pounds of dressed meats, excluding lard, are estimated to have been marketed, of which $2\frac{1}{2}$ billion pounds were exported.

DO YOU KNOW THAT -

Satisfactory substitutes have been found for platinum for various purposes, but in some chemical requirements and for use in high-duty electrical contacts no substitute has been found.

In 1921 the world's production of coal dropped back to the level of production in 1909, with the total output put at approximately 1,100,000,000 metric tons.

As the result of a series of tests made by the Bureau of Mines with the geophone, it has been determined that a pure nickel diaphragm is best suited for detecting sounds through natural strata over long distances.

The Heir Apparent to the Throne of Ethippic visites to install at Adis Abeba, Abyssinia, a mill for producing unbleached cotton sheetings from locally grown short staple cotton. The production required would be approximately 500 yards per day.

DO YOU KNOW THAT -

Stoves, ranges, heuse-heating boilers, and het-air furnaces are as a rule intended for the use of anthracite coal or coke. Whenever bituminous coal is burned in such furnaces all the principles of combustion are violated and smoke results.

Since in the tropics the hay and straw lack the "sappiness" so essential to milk cows, which is found in the hay and straw of the temperate climates, the cows in the tropics do not provide a milk of as good a quality as in the temperate regions.

Almost all forms of agricultural machinery that have come into general use in Europe during the past twenty years originated in America.

The Panama government has appointed a commission of experts to investigate alcohol as a fuel for motors. They will conduct experiments on one of the sugar plantations of Aguadulce.

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RESEARCH INCUIRIES

Answered by the Research Information Service, National Research Council, Vashington.

Question--Will you kindly furnish references to publications dealing with the milling of wheat? Answer--The following books will give you some information on the General subject of flour milling: Processes of flour milling, Percy A. Amos; Book of wrinkles, American Miller, Mitchell Bros. Publishing Co., 1912; Wheat and flour primer, Washburn & Groscy Company, pub., Minneapolis, Minn.; Flour milling, P. A. Kozmin, Van Nostrand, 1917; Milling and baking tests of wheat containing admixtures of rye, corn cockle, kinghead and wotch, U. S. Dept. of Agriculture, Bulletin No. 328; Millers almanack, Northwestern Miller, Minneapolis. The United States Federal Trade Commission published in 1920 a report on Commercial Wheat Flour Milling, which may be secured from the Superintendent of Documents for 10g. The Department of Agriculture published the same year two reports: Elack, "Insect Control in Flour Mills," and Keenan and Lyons, "Microscopic examination of Flour."

Question--An exploring trip to South America is contemplated. The boiling point apparatus, illustrated by Negretti and Zambra and assembled in their catalogue, "Apparatus for Determining Elevations by the Temperature of Boiling Water", is desired. Will you advise no where this apparatus can be obtained promptly on request? Answer--A letter from Instruments Limited, Ottawa, Canada, indicates that this firm can furnish the boiling point apparatus which you desire.

Question--Where can a permanent magnet of the Jamin type be produced? Answer--Com-Pound magnets of the Jamin type were formerly listed by physical apparatus makers and dealers in the United States but seem to have been discontinued by them. They are advertised in E. Leybold's "Nachfolger", Cologne, Germany. They have carrying capacities of from three to seven kilos and sell from \$6.50 to \$30.00 each, f.o.b. Cologne. These can be obtained through the large instrument importing companies of this country.