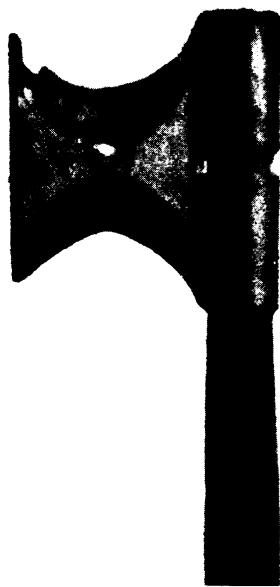


characteristics of what is vaguely termed a "good singing" voice.

From the thousand and more oscillograph records a hitherto unreported frequency in the band of sound waves from E flat to F sharp of the last octave on the piano has been discovered in the well-produced voices of men. This is the "ring" of the voice, and occurs in considerable amounts, and at the same frequency, regardless of the fundamental pitch or the vowel being sung.

All the attributes of good vocal quality, declares Mr. Bartholomew, tend to appear when the throat is enlarged, as many voice teachers have long known. Such teachers use many types of mental imagery to help the pupil relax the swallowing muscles that tend to tighten the throat. Different types of imagery have equal success and appear to help in building up psychological aids in securing correct muscular settings, which is often awkward for the beginner.

Science News Letter, February 1, 1936



LIKE A LICTOR'S AX

FORESTRY

New Foresters' Tool Looks Like Symbolic Fascist Ax

A NEW-TYPE tree pruning tool looking like the symbolic ax that thrusts its blade from among the bundle of rods in the Fascist emblem will soon be appearing on the shoulders of foresters going into American woods so that they can aid young trees to grow up straight and produce knot-free lumber.

The steel blade, however, will be a real working tool, not a political emblem. And it will not be an ax, for it will be sharpened not on its outer edge but at top and bottom.

The tool is the invention of J. H. Rich of Massachusetts State College. It consists essentially of a rectangular piece of steel, with half-moon-shaped concavities cut into top and bottom sides. These are whetted to razor edges. The blade is socketed on the end of a pole.

In use, the upper edge is first set against the under side of the branch to be pruned, and the forester gives it a quick thrust. Then he hooks the lower edge over the top of the branch, and gives it a firm pull. The two cuts meet, shearing the branch off cleanly. The forester swings the pole a little to one side so that the falling branch will not strike him, and goes after the next branch.

The tool is intended for use on small branches only, and will not replace the pruning saw for larger-sized jobs. But the inventor claims that it is much superior to the saw within its scope, particularly on branches from six to seventeen feet up the trunk.

Science News Letter, February 1, 1936

AGRONOMY

Conservation Would Withdraw Same Acreage as A.A.A.

SOIL conservation rentals, to withdraw erosion-threatened land from the plow and put it into pastures, trees or other permanent vegetation, will retire just about the same number of acres as were taken out by the restriction agreements under A.A.A., if new legislation now pending before Congress is enacted.

At a conference in his office, Secretary of Agriculture Wallace disclosed this estimate, based on a survey made for him by the Soil Erosion Service last autumn, when the complete destruction of A.A.A. was not even thought of.

The survey was made of lands on unsafely steep slopes, now in the three big money crops, wheat, corn and cotton. The slopes are in the classes called C and D by the Soil Conservation Service. C slopes are those that must be put into grass to prevent their rapid ruin through erosion. D slopes cannot be saved even by permanent grass, but must be held by deeper-rooted trees.

The survey indicated that 35 million acres of the three crops are now being grown on such slopes. A.A.A. withdrawals in 1935 amounted to 30 million acres; in 1934 they were 35 million acres. The net result of the new scheme

of acreage withdrawal, pointed especially at soil conservation rather than the elimination of price-depressing surplus production, would be to shift the uncultivated acres to places where they would do the most good to the nation's land itself.

Even these withdrawals will not wholly meet the situation produced by the destruction of America's foreign markets through ultra-nationalistic measures taken by European governments, Secretary Wallace indicated. To cut our production to this level, 50 million acres would have to be taken out of the major farm crops. Hope that such drastic action will never be necessary was expressed by the Secretary, who looks for a return, sooner or later, of "world sanity."

Even more sweeping cuts in acreage, to meet the soil erosion and soil exhaustion problems to the very limit, have been proposed by persons not connected with the Government. These have run as high as 30 per cent. of all our crop lands, and would mean reductions on the order of 100 million acres. This figure is not thought of as a serious possibility by Secretary Wallace.

Science News Letter, February 1, 1936

VETERINARY MEDICINE

New Hog-Cholera Vaccine Promises Better Results

PIGS WILL be better protected against their worst disease, hog cholera, by a new vaccine now under investigation by research workers of the U. S. Department of Agriculture. Crystal violet, a chemical not hitherto used in preparing such vaccines, appears to be the key to its greater effectiveness.

In preparing hog cholera vaccines in the past, three other chemicals have been used: glycerin, formalin and phenol. Vaccines generally are made by adding to blood serum containing the virus of the disease some chemical that will weaken its power to harm, yet not de-

stroy its ability to provoke the formation of disease-preventing "anti-bodies" in the blood of the animal or person to be protected. Crystal violet appears to be a much more advantageous material to use for this purpose than any of the three older chemicals.

One of the disadvantages of preventive treatments now in use for hog cholera has been the necessity of using unmodified disease-bearing serum along with them and hog cholera virus, even under veterinary precautions, is not very welcome on a farm. The new treatment promises to do away with this part of the treatment.

One thing that must be determined,

however, before the crystal-violet vaccine is put into use, is its time-lag. At present it appears to take about two weeks for it to become effective; so its use in emergencies might be under some handicap.

Its cost, for large-scale use, cannot be determined until mass production is undertaken, but it is believed that it will be materially less expensive than the preventive treatments now in vogue.

Crystal violet is a dyestuff belonging to the large anilin family of chemicals. Its common name is used as a matter of convenience instead of its longer technical title: hexa-methyl-para-rosanilin.

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CLIMATOLOGY

1935 Wetter Than 1934, Also Somewhat Cooler

DROUGHT and heat were rampant in 1934; broken in 1935. Popular impressions on these points receive confirmation and emphasis from a comparative study of weather records of the two years, which has just been completed by the U. S. Weather Bureau.

For the year as a whole, the meteorologists state, the temperature averaged somewhat higher than normal all over the country, except for two limited areas of slightly below-normal temperatures in the Northeast and Northwest. Yet they were still below the quite abnormally high figures for 1934.

The Bureau scientists summarize highs and lows: "The lowest temperature reported in 1935 was 51 degrees below zero at Pine River Dam, Minn., but Grantsburg, Wis., was a close second with fifty degrees below, both occurring in January. The highest for the year was 123 degrees at Cow Creek, Calif.,

in July. This compares with a low of 52 degrees below zero at Stillwater Reservoir, N. Y., and a high of 125 degrees in Death Valley, Calif., for the preceding year. The highest and lowest all-time temperature records for the United States are 134 degrees in Death Valley, Calif., and minus 66 degrees in Yellowstone Park, Wyo."

Rainfall for 1935 far exceeded that for the previous year, even in regions where it still fell short of normal. It did fall below normal in two regions usually accounted rather moist, the Great Lakes region and the Southeast. Elsewhere, especially in the greater part of the traditionally drier West, there was rainfall ranging from slightly below to decidedly above normal.

The Weather Bureau study summarizes: "Except very locally, the only section of the country having less precipitation in 1935 than in 1934 was the Pacific Northwest, while on the other hand, large areas, especially the interior valleys and Great Plains, seriously dry in 1934, had approximately normal to considerably above normal precipitation in 1935.

"An outstanding feature of the year's weather was the persistent spring wetness in the interior valleys. At the beginning of 1936, the soil-moisture situation generally was satisfactory over the eastern half of the country, but most of the western half was still needing precipitation, though heavy rains and snows occurred over the Pacific Northwest during the first two weeks in 1936."

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GEOPHYSICS

North America Being Pulled Into Pacific Ocean

NORTH America is being pulled into the Pacific Ocean by the attraction of the dense layers of the earth's crust which are below the bottom of the Pacific. This in substance is the conclusion of an investigation reported by Dr. Ross Gunn of the U. S. Naval Research Laboratory.

The movement results in a great thickening of light material on the forward edge of the moving continent, which well accounts for the growth of mountain ranges like the Sierra Nevada in the Pacific coast states, adds Dr. Gunn in his report to the *Physical Review*.

Measurements on the velocity of sound waves, states Dr. Gunn, indicate that layers under the Pacific Ocean have a density greater than similar layers underlying the continents. This dense mass of material produces a component of gravitational force at an angle to the normal vertical pull of gravity.

It is this sidewise or tangential pull of gravity which is tugging North America gradually westward, according to Dr. Gunn's findings.

The geophysical evidence, Dr. Gunn maintains, substantiates his earlier papers concerning the origin of the solar system.

Dr. Gunn has shown that a star can acquire sufficient angular velocity to split into two parts. As the parts separate, while revolving around one another, enormous tidal forces are set up which cause both parts of the original star to lose pieces of themselves that eventually become planets. These planets, as they fly off, are hotter on one side than on the other.

It is this difference of temperature, Dr. Gunn has maintained, which ultimately accounts for the uneven distribution of the continental and oceanic hemispheres of the earth, the lopsidedness of the earth's magnetic field and the uneven distribution of the density in the various layers of the now-cooled earth's crust.

It is the last point, the much greater density of the earth's crust beneath the Pacific Ocean, that accounts for the tangential gravitational force that moves North America westward.

Tangential forces in regions of sedimentation and crustal weakness, explains Dr. Gunn, cause overthrusting of the outer layers. The overthrusting ultimately results in the observed mountain changes.

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● RADIO

February 4, 4:30 p. m., E.S.T.

A FUTURE FOR AMERICA'S BIRDS AND BEASTS — Ira N. Gabrielson, Chief of the U. S. Bureau of Biological Survey.

February 11, 4:30 p. m., E.S.T.

THE CRIMINAL MIND — Dr. John E. Lind, St. Elizabeth's Hospital, Washington, D. C.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.