Tuberculous Cattle.

A dispatch from Washington is to the effect that, as soon as the appropriation of $100,000 in the agricultural bill becomes available, the Bureau of Animal Industry of the Agricultural Department will begin an investigation of the prevalence of tuberculosis among cattle. The investigation will be commenced among herds from which Washington itself gets its supply of milk Various herds in that section of the country have been inspected and tested from time to time, with startling results. A herd ten days ago on a farm in the District was found to have 80 per cent of its animals infected; and a few days before that no fewer than 90 animals in a herd numbering 125 near Richmond, Va., were discovered to be diseased. These are extreme and unusual cases, it is true; but occurring synchronously within a narrow radius, they were enough to rouse the government to a sense of the danger to which the country is exposed from this source. An experiment performed by one of the scientists attached to the animal industry laboratory about the same time tended in the same direction of alarm. Ascertaining from test experiments which he had been making with the milk supply of the capital that it was tainted with tubercle, though perhaps not tainted sufficiently to be very dangerous to human health, he inoculated a guinea pig with the milk; and, sure enough, after a few days, when the tubercle bacilli in the milk had had time to plant themselves and develop in his system, the rodent exhibited unmistakable tuberculosis. Concurrent circumstances like these, forced on the attention of the government, produced the belief that it was about time a general investigation of diseased cattle should be made, if the danger to human health so portended would be avoided.

The way in which cattle are diagnosed most easily and most surely for tuberculosis is by the inoculation of them with an infinitesimal quantity of a preparation of which we heard much more a few years ago than we hear now—Koch's tuberculin. Tuberculin is a pretty expensive drug, costing $8 for about a teaspoonful. The government prepares considerable quantities of it, and distributes it free among State boards of health and live stock commissioners. Inoculated with tuberculin, cattle straightway declare whether they are infected with tubercle or not, by the reaction that follows or fails to follow the inoculation. Now, tuberculin has been furnished to 23 of the 44 States of the Union; and the tests which have been returned to the government from these States, although they have not nearly all been returned yet, show conclusively that the disease is spread among cattle throughout almost the entire Union. In fact, the probabilities are that it will be found that 5 per cent of all the cattle in the United States are suffering more or less with tuberculosis!

That is the alarming state of things of which the government will have to take account, and for which it will some way or other have to devise a remedy. It cost $1,500,000 to eradicate contagious pleuro-pneumonia from United States herds, and the amount of contagious pleuro-pneumonia was not a tithe of the amount of tuberculosis which at present exists. So many milch kine alone are infected with it, says Dr. Salmon, of the Bureau of Animal Industry, that, if they be all killed, "fresh milk will cost as much as champagne." It would be well for us not to forget that of all our cattle, and especially of our milk-givers, at least 5 in every 100 are infected with tuberculosis; which disease, appearing most commonly as consumption in the human subject, is easily communicable both through meat and through milk. Common prudence would suggest the necessity, therefore, of boiling all milk before it is administered to anybody.—*N. O. Times-Democrat.*

The Press in the Arctic Regions.

There exist at present several journals that make their appearance but once a year. They are therefore not "journals" (literally, "dailies"), accurately speaking, but "annuals." These sheets are published within the confines of the north polar circle. The *Eskimo Bulletin*, for example, is edited near Cape Prince of Wales, on Behring Strait. Here, in a village inhabited by Eskimos, the English missionaries have established a school, and as but one steamer lands at this place, and that, too, but once a year, the news that it brings is consigned to a sheet of paper printed with the hektograph. Its size is 8 by 12 inches. The paper is very thick and but one surface is used. This journal, in a subhead, claims to be the "only yearly paper." This, however, is an error, for there is an annual sheet published at Godthaab, in Greenland, where a small printing office was established in 1862, whence about 280 sheets and many lithographic prints have been issued. The journal in question is entitled *Atuagagdlintit, nalinginarmik tusaruminasassumik*, *i. e.*, "Something for reading, accounts of all sorts of entertaining subjects." It has been published since 1861, and up to 1874 comprised 194 sheets in quarto, and about 200 leaves with illustrations. The language is that of Greenland, a dialect of the Eskimo. There is still another periodical published in Greenland under the name of *Kaladlit.*

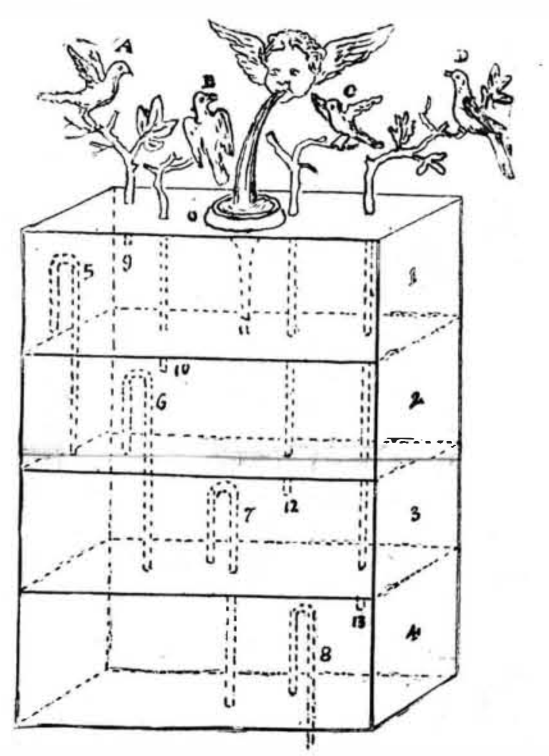
AN ANCIENT AUTOMATON.

BY W. F. DURFEE.

If a skillful mechanician of the present day should undertake to construct by the use of modern mechanism an automaton imitative of a concert of singing birds, he would doubtless turn his attention at once to some combination of bellows, pipes, reeds, pin barrels, levers, wheels, springs, and regulating flies; and would introduce a judicious mixture of cranks, cams, connecting rods, valves, and wind chests.

When finished, the result would be a marvel of mechanical skill and elaborate ingenuity. When it was "wound up," its birds would doubtless sing with such vigorous disregard of all the requirements of the science of bird music that the living songsters whose notes were intended to be imitated would feel tired, discouraged, and full of regret that they had ever been hatched. The expense of such a contrivance would be commensurate with its complexity; and, however great its success as an imitative mechanism, would prove a bar to frequent reproduction.

If the inventor of such an automaton should be told that about 2,000 years ago groups of artificial birds were made to sing equally as well as his, without the use of a wheel, pinion, lever, crank, or revolving mechanism of any kind; he, remembering the wealth of time, thought, machinery, and money he had expended, would probably dismiss the suggestion as the culmination of all that was mechanically absurd and ridiculous, and would entertain unutterable opinions of the very uncommon character of the sense of him who made it; but, notwithstanding the indignant doubts of this modern inventor, such simple and effective automata were made by the ancient mechanicians, and Hero of Alexandria has left us an account of some of them.



AN ANCIENT AUTOMATON

In his "Spiritalia" (written about B. C. 150) Hero describes several automata, of which figures of birds form a part; but perhaps the most remarkable for its ingenious simplicity is No. 44, the illustration of which we reproduce.

The description of this, as given by Hero, is somewhat meager and unsatisfactory, but the drawing is so very plain that, taken in connection with other mechanism in his work, operated in a similar way, it is easy to understand how the desired result was accomplished.

An air-tight box of metal was provided, which was divided into four compartments, 1, 2, 3, 4, by horizontal diaphragm plates. On the top of this box was a basin, O, for receiving the water of a fountain. Around this basin were four birds, A, B, C, D, perched upon branches or shrubs, which apparently grew out of the top of the box. Each of these branches was hollow, and communicated with one of the compartments already named by one of the pipes, 9, 10, 12, and 13, which passed but a very short distance through the tops of the several compartments. The bodies of the birds were also hollow, and were connected with the hollow branches by tubes in their legs. In the hollow body of each bird were two musical reeds or whistles of different note. One of these would sound when air was forced outward through the beak of the bird, and the other would only respond to air drawn inward. This alternate action of the air, and consequent variation of note, was produced by the peculiar way in which the water supplied by the fountain was made to pass through the several compartments.

The water from the basin, O, entered compartment, 1, near its bottom by the pipe, 11, and as it rose in the compartment it compressed the air above it, which escaped through the beak of the bird, A, and caused its first note to sound; but when the water reached the top of the bend of the siphon, 5, it at once commenced to discharge by that siphon into compartment, 2; but as the siphon, 5, was so proportioned that it discharged the water much faster than it was supplied by pipe, 11, the level of the water in compartment, 1, gradually fell, and the air in passing into this compartment through the beak of the bird, A, caused its second note to sound. As the water rose in compartment, 2, it compressed the air above it, which passed by the pipe, 10, to the bird, B, which then sounded its first note, while the bird, A, was sounding its second, and this state of affairs continued until all of the water was discharged from compartment, 1, and compartment, 2, was filled to the top of the bend of siphon, 6, which then commenced to discharge into compartment, 3, and as siphon, 5, had ceased to operate, the water gradually fell in compartment, 2, and the air entering by the beak of the bird, B, sounded its second note. While this was taking place compartment, 1, was again filling, and the first note of bird, A, sounding, and compartment, 3, was also filling, and the air above the water therein was being forced by the pipe, 12, into the bird, C, and causing its first note to sound.

By following out the operations described, and tracing the action of the flux and reflux of the water in the compartments, 3 and 4, it will readily be seen that the bird, C, will sound its second note when the compartment, 3, is being discharged by siphon, 7, into compartment, 4, and at the same time the bird, D, will sound its first note, and that eventually the water will escape from the automaton by the siphon, 8, causing the second note of the bird, D, to be heard.

It is evident that by simple and well known means any or all of the bird notes can be made to trill, and that it is only necessary to properly proportion the discharging capacity of the siphons to insure the repetition and admixture of the notes in a bird-like manner; and it is further evident that the employment of the ideas involved is not of necessity confined to but four birds, as several birds, each having different notes, might be operated from the same compartment, and of course as many compartments as may be wished can be used. Furthermore, the wings of the birds could be made to move, and their beaks to open and shut, by the movement of the same air which acted upon the musical reeds or whistles.

Each of the siphons in the automaton was intermittent in its action, ceasing to flow when its compartment was emptied and commencing again spontaneously when the water reached the level of the top of its bend. The antiquity of intermittent siphons is of special interest from the fact of their comparatively recent application in sanitary plumbing.

Chaucer was not much in error as regards his own time (1328–1400), and his words are only somewhat less true to-day:

> "For out of the old fieldes, as men saithe,
> Cometh al this new corne fro yere to yere;
> And out of old bookes, in good faithe,
> Cometh all this new science that men lere."

Odors of Volatile Oils.

The tendency of the results of recent investigations is to show that, instead of the characteristic odor of an essential oil being invariably due to one single principal constituent, the other bodies present have also a distinct value in determining the odor. In addition to volatile oils of which the odor is simple in character, there are others in which several odoriferous bodies combine to produce the characteristic odor. Thus the oils of caraway, anise, and linaloe are examples of those in which the aroma is due to a single odorous body—carvol, anethol, or linalool—the determination of which suffices as a test of their value and purity; whereas the conditions are more complex in the case of the oils of cassia and cinnamon. The odor of cinnamic aldehyde, the chief constituent of cassia oil, is adversely affected by the presence in the oil of cinnamyl acetate, in greater or less proportion; while in Ceylon cinnamon oil, eugenol, phellandrene, and small quantities of other compounds not as yet identified, affect the odor of the aldehyde beneficially. Though, therefore, the value of cassia oil may be directly estimated by quantitatively determining the amount of aldehyde contained in it, the same process is not applicable to cinnamon oil, in the case of which the percentage of this ingredient is only one factor in the valuation of the article. Still more complicated conditions exist in the cases of lavender, bergamot, neroli, and petitgrain oils; and rose oil affords a striking example of the important influence which combinations of odoriferous bodies sometimes exercise on the perfume. The oil of rose, geranium, and palmarosa contain approximately the same percentage (80 to 90) of geraniol, which is identical in the three oils. While, however, the last two oils are valued in proportion to the amount of geraniol they contain, the value of rose oil depends upon the various other bodies present, the investigation of which will be necessary before a scientific basis can be found for the chemical examination of rose oil.—*Schimmel's Bericht.*