



500,000 WATTS

*This power, ten times that of the largest American broadcasting stations today, will be radiated from experimental transmitter W8XO nearing completion by the Crosley Radio Corp. at Mason, Ohio. A new 831-foot vertical radiator type antenna is shown towering above the plant. The new transmitter, a bold step toward "super-power" broadcasting, will first operate on test from 1 a. m. to 6 a. m. and is later expected to transmit broadcasts regularly.*

process of improvement, yields of from 250 to 300 milligrams of vitamin in crystalline form have been obtained from 50 kilograms of rice polish. While this amount seems very small when considered in terms of large scale production of ordinary substance, since 100 milligrams is only one and one-half grains, roughly, and 50 kilograms is over 100 pounds, it represents from five to fifteen times the yield obtained heretofore by other investigators.

Lack of this vitamin causes nervous disorders, among them beri-beri. While the amounts necessary for health can be added to the diet by ordinary foods as whole grain cereals, chemists need to have rather large supplies of it in crystalline form for further investigations as to its chemical composition and effects on the body. Drs. Williams and Eddy hope that by their method, several steps of which have been carried out on a large scale according to a factory type of operation, they will be able to make the vitamin available in quantities of several grams.

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## BIOCHEMISTRY

# Men Are Walking Drugshops, Dr. Abel Declares in Address

## From Human Organs, Pharmacist Can Prepare Arrow Poisons That Would Have Delighted Primitive Warriors

"**W**E OURSELVES are walking drug shops. An experienced chemist or pharmacist would have no difficulty in preparing arrow poisons from some of our own organs that would have delighted the heart of primitive man."

These perhaps surprising statements were among the many facts about poisons that Dr. John Jacob Abel, emeritus professor of pharmacology at the Johns Hopkins Medical School, told members of the American Association for the Advancement of Science in his address as retiring president.

Dr. Abel emphasized the chemical nature of disease, saying that most bacteriologists now believe all infectious diseases are really poisonings. For some diseases such as diphtheria and lockjaw, this has been proved. It is known that these diseases are caused by a poison produced by the "germs" or bacteria. In other diseases, medical scientists suspect that the disease is really a poisoning from some substance produced by the "germs," even though they have as yet no proof for this belief.

The first physiological or pharmacological experiment made by man was probably the smearing of arrows and spear heads with poisons, he said.

"Stinging insects and venomous serpents were no doubt the first among animal forms to invent hypodermic injections, a procedure which was introduced into medical practice only in the years 1845 to 1856," he continued.

The poisons which these insects and snakes produce were not developed solely for self-protection, however. The snake's venom is indispensable to its health, besides containing ferments necessary for its digestive processes. Similarly, the poisons of bees and wasps appear to aid in the development of their eggs after they have been fixed on them.

"Nature has not affixed a poison label to any particular substance or class of substances," Dr. Abel said. "The pharmacist does that."

Among the substances in man's own body which may be poisonous in certain doses are insulin, which controls sugar utilization and is necessary for life and health; adrenaline or epinephrine produced by the adrenal glands and a valuable medicine in certain conditions of diseases; and the hormone produced by the parathyroid glands, excessive amounts of which cause calcium to be removed from the bones at such a rate that they soon cannot support the weight of the body, besides causing other conditions leading to death.

Vitamins, which Dr. Abel characterized as plant hormones, are also poisonous in large doses, although necessary to life in certain amounts.

"From the wider biological view, we should not think of poisons as being inherently more malevolent than any of the other agents or influences of our environment to which we are constantly exposed," Dr. Abel stated. "I incline to the belief that no living cell exists whose contents or metabolites are not toxic to some other living cell."

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## ARCHAEOLOGY

## Saul's Fortress-Palace Found At Gibeah

**A**RCHAEOLOGISTS have at last identified the fortress of King Saul, the walled capital from which the Bible hero went out time and again with his soldiers to wage war against the enemies of Israel. Success in identifying the ruins of Saul's palace-fortress is reported by Prof. W. F. Albright, director of the American School of Oriental Research in Jerusalem.

The site is known today as Tell el-Ful. Prof. Albright began excavating there twelve years ago. But his work was interrupted before the history of the fortress could be traced. That the site was really Gibeah, the capital of King Saul, has long been accepted as presumably true. But like most Bible sites, this one had a number of stages

in its career. It remained for archaeologists to probe through the layers of broken walls and debris, and to find the walled capital of Israel's first king.

The excavations reveal that a village of about the twelfth century B.C. first stood on the hill. Traces of fire which destroyed this village can be seen, thus confirming the Bible record of the tragedy that befell Gibeah, as told in the Book of Judges. In the eleventh century, King Saul's royal fortress rose on the hill. And after its destruction, other settlements followed on the site.

A problem which beset archaeologists was that the fortress seemed small, considering its status and the retinue of the king. But this discrepancy is now cleared up. What was thought to be the king's citadel turns out to be merely the corner tower. The entire fortress was at least 170 feet long and 115 wide.

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lief in the necessity of its use. Hunger is lacking and the material to feed it is not accessible. But appetite grows with eating. The trouble with much of what is called the popularization of knowledge, is that it is content to diffuse information, in diluted form, merely as information. It needs to be organized and presented in its bearing upon action. Here is a most significant phase of the obligation incumbent upon the scientifically trained men and women of our age. When there is the same energy displayed in applying knowledge to large human problems as there is today in applying it in physical inventions and in industry and commerce, many of our present problems will be well on their way to solution. . . .

James McKeen Cattell is himself an active scientific worker, one who has initiated in his own field of psychology many movements that have borne rich fruit. But he has found time, thought and energy to devote to the larger questions of the bearing of science upon life. He has given himself without stint to the better organization of scientific workers in all fields, to the improvement of the condition of academic workers, to the task of editing and diffusing the achievements of scientific inquiry. I do not need to press home the moral in connection with the intellectual obligation of which I have spoken. Laboring of the point is unnecessary as long as we have Cattell with us.

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### ARCHAEOLOGY

# Genealogy of First Family Of America Traced to 1400

**S**OCIETY leaders and many other people in America who take a keen interest in titled families have probably never heard of the Xiu family. But they should. For the Xiu have the oldest known family tree of the American nobility surviving today. Their genealogical record has been traced back unbroken to 1400 A.D., on American soil.

Members of the Xiu family who live in Yucatan are descendants of a great line of Indian rulers that governed for more than five centuries. These ancestors played star roles in America's greatest ancient civilization. Such were the flower of Indian nobility for whom skilful craftsmen made gold and jade jewelry and featherwork head dresses. They were leaders in the procession and public events.

Now, the Carnegie Institution of Washington has undertaken to bring together as much of their genealogical record as can be traced in ancient documents and in interviews with living members of the family. The evidence is chiefly in a collection of the Xiu family documents in the Peabody Museum at Harvard. There are also unpublished documents in libraries at Tulane University and the University of Pennsylvania which shed light on the career of the distinguished old family.

The Xiu papers present an unbroken history of this famous family from about 1400 A.D. until 1817. Ralph Roys, of the Carnegie Institution of Washington, writing in that institution's annual report, rates this as a unique record. Not even the lineage of the Aztec Montezumas or the ruling Incas of Peru can be traced in this manner.

With the fall of the Spanish regime in Yucatan, the family papers end, and the scientific investigator made a trip to Yucatan to search more recent church and government documents and to interview numerous members of the family.

Practically all the living Xiu who could be located were traced back to ancestors listed in the 1817 patent of nobility.

Like many another noble family, their life has become hard. After ruling for

more than five centuries, and then being privileged nobles for another 280 years, the Xiu for more than a century have earned their bread by hard work.

As one observation of genetic interest, Mr. Roys comments:

"The direct descendants of the last noble head of the family have not done particularly well during their century of economic struggle, for they are less prosperous and show a higher rate of infant mortality than the collateral family groups which were the subjects of this study."

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### CHEMISTRY

## Cotton Tried As Binder In Asphalt Paving Blocks

**C**OTTON was used as a reinforcing material in making asphalt paving blocks exhibited at a lecture before a Washington audience of the noted Negro chemist, Prof. George W. Carver, who has built up a wide reputation through his life-long researches on new uses for the agricultural products of the South. About 3½ per cent. of the blocks, by weight, consisted of cotton; the reinforcement, Prof. Carver stated, increases their strength and resistance to wear. "Roads made of these blocks would use up forty bales of cotton to the mile," he said. "That should dispose of a lot of our surplus cotton."

Prof. Carver fascinated his audience by fishing up out of a capacious bag samples of an endless array of products, ranging from a dozen kinds of milk and cream to hair tonic and wall paper, all made by chemical manipulation of peanuts. He has made hundreds of synthetic products from these humble vegetables, as well as many more from sweet potatoes and other unpromising materials, some of which have come into commercial use. Being completely indifferent to money himself, Prof. Carver has not profited personally by the exploitation of any of his chemical inventions.

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Statistics show that more schoolboys die from accidents than from all the usual communicable diseases combined.