# SCIENCE NEWS

## THE BIRTHPLACES OF EMINENT AMERICANS

*Science Service*

WHERE have the notable people been born and in what kinds of homes? This question has been asked by many, and diverse answers have been given. Some persons have asserted that most famous Americans were born on a farm, as were Lincoln and Coolidge. On the other hand, certain studies of eminent people have revealed that many were born in cities and in the homes of professional people.

In order to throw light upon these questions, all persons whose biographical sketches appeared in the 1922–1923 edition of the "Who's Who in America" were asked to indicate both their type of birthplace and the chief occupation of their father. A study of the 18,400 returns received has recently been completed.

These returns indicate that 25.9 per cent. of the present-day American notables were born on farms, 24.5 per cent. in villages and towns, 24.8 per cent. in small cities, 20.6 per cent. in large cities and 4.1 per cent. in suburbs. In proportion to the population at the 1870 census, the census nearest the birth of most of the notables, cities contributed nearly six times as many as did farms, villages nine times as many and suburbs apparently about eleven times as many. The fathers of 70 per cent. of these persons belonged to the professional or business classes (34.3 and 35.3 per cent., respectively); 23.4 per cent. were farmers, 6.3 per cent. were skilled or semi-skilled laborers and only 0.4 per cent. were unskilled laborers. In proportion to population at the 1870 census, these classes ranked in the production of notables, in the order given, and had a value of about 1,400, 600, 70, 30 and 1, respectively. In other words, farmers fathered slightly fewer notables than their proportionate share, but they did much better than other manual workers, contributing 2 1/3 times as many as skilled and semi-skilled laborers and 70 times as many as the nearly one half or all the men of the nation who were classed as unskilled laborers. Business and professional men fathered 7 and 16 times, respectively, the number of notables that would be expected on the basis of the small proportion they made of the population. Clergymen did exceptionally well, according to these returns, having fathered fully 28 times their proportional share of notables, or over 2,400 times as many as the average unskilled laborer.

There are two radically different possible interpretations of these data. Certain eminent biologists believe that heredity is of prime importance and hence that the nation's notable men come from the intellectually superior elements of the population, which are concentrated in certain types of occupations and places. On the other hand, others believe that environment is the chief factor, and, if given a proper chance, many people who never become eminent could rise so far above the average as to merit inclusion in such a standard work as "Who's Who in America."

This study does not indicate whether "nature" (environment) or "nurture" (heredity) is the more important, nor does it accurately describe conditions to-day when the leaders of the fifty years hence are being born. It does, however, clearly indicate that a large share of the present notables came from certain relatively minor elements of the population, more than 1/3 from the professional classes which comprised only 1/45 of the population in 1870. The five per cent. of the men of America classed as business men contributed 35 per cent. In contrast, unskilled laborers fathered almost none of the notables in "Who's Who," and although farmers fathered nearly one fourth, that proportion is slightly less than their share in proportion to population.—*S. S. Visher.*

## A NEW GOOSEBERRY

*Science Service*

THE elevation of the humble gooseberry from its present position as a minor fruit, good only for pies and preserves, to the dignity of a table fruit on a par with cherries, plums and grapes, is one of the possible results from the discovery of a new species in the woods of northern Florida, a region where gooseberries have never before been known.

Gooseberries are not properly appreciated in this country is the opinion of Dr. Frederick V. Coville, botanist in charge of the Office of Economic and Systematic Botany, Bureau of Plant Industry, whose description gives the new species to science. Abroad, the fine European varieties are eaten ripe, as table fruit. But these choice varieties are subject to disease in this country, and all the hardy native species known until the present time have berries too small and poorly flavored to be of much value. Moreover, gooseberries as well as currants harbor one phase of the deadly blister rust disease that is threatening our forests of white pine, so that government forest officials are urging that gooseberry culture be strongly curtailed.

Into this rather unpromising setting the new Florida species comes almost like a horticultural fairy godmother. It is probably the biggest wild gooseberry ever discovered, the fruits reaching seven eighths of an inch in diameter. A hybrid with the large-fruited European varieties need not lose size. It is native in northern Florida, far south of the present centers of gooseberry culture, and what is even more important, far south of the white pine region. Therefore it can be cultivated without regard to the white pine blister rust, and there will be the added advantage of having berries ready for market much earlier than at present. It seems to be quite immune to the mildew disease to which the European varieties are susceptible.

In its present wild state the fruit has one notable drawback. Each berry is covered with so many long, sharp

spines that it suggests a little porcupine. It is hoped that these can be eliminated in the breeding experiments now under way at the Department of Agriculture.

The honor of the discovery of this promising berry is divided between Professor Herman Kurz, of the Florida State College for Women, and Dr. Roland M. Harper, of the Florida State Geological Survey. They came upon it in the woods along the shore of a little lake near Tallahassee in the course of a Sunday botanizing trip. They notified Dr. Coville, as the recognized expert in this part of the botanical field, and after several trips to the region to obtain specimens, seeds and bushes for transplanting, he announced the find to the scientific public.

## THE CONTROL OF THE COTTON WEEVIL

*Science Service*

FIND what it is in the cotton plant that the boll weevil likes; produce it in marketable quantities; bait traps with it or mix it with poison, and so lure the insects to their destruction. That is the skeleton of the idea on which scientists of the U. S. Department of Agriculture are working.

When the weevil comes out of its winter sleep, in the vicinity of a cotton-field, it somehow knows enough to make a bee-line for its natural home. It will sometimes travel considerable distances to reach growing cotton if there are no plants near at hand.

Dr. Frederick B. Power, the leading biochemist in the Bureau of Chemistry, with the cooperation of V. K. Chesnut, of the same bureau, is endeavoring to find which of the many complex substances in the cotton plant gives it this peculiar attraction for the weevil and this is a very difficult task. Large quantities of cotton plants have been subjected to steam and distillation processes, and the substances isolated tested for their power of attracting boll weevils. This part of the work falls to the Bureau of Entomology, where workers watch the behavior of the insects toward the various substances.

Dr. Power states, with the characteristic caution of a thorough scientist, that he is "making progress," but will not make a direct claim that the problem has been solved. The results of the investigation will be announced to the scientific world and to the public in due time.

This new attack on the boll-weevil problem may well become the pioneer work in a wholly new departure in the study of the relations between plants and the enemies that attack them. There are many other insects that show a similar preference in the choice of the plants they feed on. Potato beetles, for instance, confine their diet chiefly to potato plants; the Hessian fly commonly attacks nothing but two or three kinds of grain. In all such cases, there must be some definite attraction exerted by the plant, some specific substance that appeals to the insect so strongly that it will turn from all other things to seek it. If such substances can be isolated and used as baits loaded with poison, or placed in insect traps, or set over pans of water or oil, or in other ways utilized to lure insect pests to their doom, another step will have been taken in the solution of the crop pest problem.

## CELLULOSE

*Science Service*

CELLULOSE, whose chemical structure has baffled chemists for a century, is yielding to the searching eye of the X-ray spectrograph in the hands of Dr. O. L. Sponsler, botanist in the University of California, Southern Branch. The most recent photographs lead to the belief here that cellulose—a stick of wood for example—consists of a multitude of strings of molecular beads all running parallel.

Many years ago chemists discovered that cellulose consists of carbon, hydrogen and oxygen in the proportion of six, ten and five atoms, respectively. Little more is known of its chemical architecture. Cellulose does not crystallize, vaporize, melt or do any other orthodox act which would help out the analytical chemist. In the light of X-rays, however, it now yields a series of remarkable line photographs which indicate the bead-string style of structure.

The "beads" are all alike. Each apparently consists of a cluster of the twenty-one atoms above mentioned firmly combined like an individual chemical molecule, but still chemically tied to its two neighbors in the string, above and below. It requires about fifty million of these, end to end, to span the distance of one inch. Ordinary light waves are too coarse to reveal such minute details, so that there is no hope of visibility even in a powerful microscope. The minute X-rays, however, are able to pick out and exhibit such atomic details to the camera.

Dr. Sponsler pictures the cellulose units acting as beads closely strung on a tight cord. The chain resists a pull better than a push. This agrees nicely with the well-known principle that a timber will withstand a greater tensile strain than a crushing strain.

The bead chains, being separate, can easily spread apart without breaking. This also agrees with the familiar fact that a timber, soaked in water, will swell sidewise but not lengthwise.

The new theory tells us that a broken strand of cellulose should have reactive atoms at the ends of the chains, where the rupture occurred, and where there is obviously no material to hang on to the last link. This agrees with the known fact that certain chemical tests work on the end of a fiber, but do not succeed on the side.

When the cellulose fibers are photographed endwise, only a few simple lines appear on the plate, and the bead-chain structure is missed. Viewed from the side, however, the strings are revealed.

## CLIMBING FISH

*Science Service*

THE climbing perch by no means is a figment of the imagination, according to Albert W. C. T. Herre, chief of the Philippine Division of Fisheries, who has just completed a classification of the fresh water fish of the Islands.

This fish occurs in ponds, brooks and rivers throughout the territory. Not only does it climb trees but is

able to move about freely on land and is remarkable for its ability to live for long periods out of the water. Its actual climbing, however, is restricted to short distances —not more than two meters up the rough trunks of certain palms.

During the dry season the climbing perch is able to survive in very small pools of semi-liquid mud. During this time it takes the hook readily. Consequently it is not unusual to see a native fishing in what seems to be a dry field of waving grain. Out of a small mud patch in such a field from one to two dozen of these fish can be taken. It is claimed that the fish can survive for six days entirely out of water.

Mr. Herre describes another order of Philippine freshwater fishes which can be drowned in water. These are the labyrinthici, characterized especially by a large cavity in the head above the gills. Into this cavity the fish takes air directly from the surface of the water. The gills are unable to supply a sufficient quantity. If prevented from reaching the surface the fish eventually will die. Popular superstitition credits these creatures with the ability to live out of water, although Mr. Herre insists that if their gills become entirely dry they will die, just as other fishes. Another species, the ophicephalidae, will drown if kept in water in such a position that they can not reach the surface occasionally. These also endure prolonged removal from water.

The most popular of Philippine food fishes, the dalag, makes long voluntary journeys over land during periods of heavy rains. When the water of an inland puddle has evaporated the dalag is able to survive for a long time by burrowing a foot or more below the surface to take advantage of the remaining moisture. Even after the surface of the mud has been caked over the fish will live as long as it is moist beneath. These fishes are sold alive in the native markets, being stunned with a club so that the customer can carry them easily.

## THE USE OF OPIUM AND COCAINE

*Science Service*

OPIUM and cocaine, aside from the large but unknown illicit consumption, have a recognized and legal medical use to the extent of 6.98 grains of pure opium and 29.32 grains of coca leaves *per capita* per year. These figures are based on the investigation of A. G. DuMez, pharmacologist in the service of the U. S. Public Health Service.

Mr. DuMez got his figures not from a general survey of the country as a whole, but from a close study of a good "sample" of the population. He chose Allegany County, in Maryland, partly because it contained no large cities with their abnormal conditions, and partly because it was a region of diversified population following several industries. He investigated the permitted use and traffic in drugs in pharmacies, doctors' offices and hospitals.

All drugs containing opium, such as codeine, morphine and paregoric, he reduced to terms of pure opium. Similarly, he reduced cocaine to terms of the coca leaves, the form in which it is imported. He found that the legitimate medicinal needs of the county called for an annual importation of 69.81 pounds of opium and 293.03 pounds of coca leaves. Divided among the 69,938 persons in the county, this allowed 6.98 grains of opium and 29.32 grains of coca leaves as the yearly ration per person.

To supply the entire United States on this basis would require the annual importation of approximately 105,687 pounds of opium and 443,988 pounds of coca leaves. Mr. DuMez is of the opinion that the lawful requirement for cocaine is falling off, because of the increasing use of synthetic local anesthetics by dentists.

Cocaine has been manufactured artificially by chemical means in the laboratory of Professor Richard Willstätter, at Berlin. Three different methods have proved successful in the production of cocaine alkaloids, and one of the compounds, named "psicain," is said to be a satisfactory substitute for cocaine in every way. The synthetic compound has the same structure as natural cocaine but opposite optical activity.

The present source of cocaine is the coca tree of South America, whose leaves must be imported at considerable expense. The present discovery, resulting from a sixty-year search for a synthetic cocaine, may make a more reliable drug available to the medical profession at a lower price. Cocaine is worth about $100 a pound, but the primary materials used in the preparation of the new compound are not expensive. The synthetic substitutes for cocaine, such as novocaine or procaine, do not form drug habits like the natural cocaine. But if cocaine like that obtained from the leaf can be made in any laboratory it is likely to nullify the laws and treaties against its importation.

## ITEMS

*Science Service*

COMPLETE radio control of the electrical substation at Tipton, Ind., supplying a city of 5,000 population, has been established. Radio waves sent from Kokomo control the switches, and through them the light and power of the community. This is believed to be the first instance of this kind in the United States. Two transmission lines to Tipton are maintained from Kokomo and Noblesville. In case of interruption on either, such as might be caused by storms, the supply can be resumed from the alternative source. Heretofore, the operation of oil switches, used to change the connection, has necessitated the constant presence of substation attendants who have received their instructions by telephone from Kokomo. The telephone has sometimes been put out of commission by storms. Under the new system, if trouble develops on either of the lines, it is instantly observed on the powerhouse instruments at Kokomo and an operator sends out high frequency waves which open the oil switch. The special wave length used is outside broadcasting range. The waves are received by antennae at Tipton and transmitted to a five-tube receiving set and amplifier. They are then carried to a series of selector relays which in turn operate the storage battery switches.