

Outstanding is the famous Ambroise Paré, the author of the classical exclamation, "I dress the wound, God heals it." He discarded the hot iron and boiling oil cauteries. He propounded the idea that pure air was beneficial in wound healing; that the impurities in the air were the source of putrefaction. This he combated with substances which were antiseptic.

Francis Arcaeus (1574) washed his wounds with alcohol, wine and myrrh, and introduced systematic drainage. From his efforts arose the "balsam of Arcaeus" composed of suet, lard, resin and turpentine, applied on lint, an antiseptic dressing which remained for centuries.

A Holland scientist, Leewenhock (1675), saw dimly but unmistakably the microscopic bodies which we now know as bacteria, and laid the foundation upon which modern practice has been built.

A year later Robert Boyle announced his discovery of the nature of fermentations and propounded prophecies as to the subsequent advances in wound treatment.

A notable event in the history of wound treatment is revealed in the work of Sir John Colbach (1698), who in theory and practice anticipated the modern era. He used an antiseptic powder and devised that which would now be termed a typical aseptic course. Unfortunately, he kept the composition of his antiseptic a secret, and thereby became subject to the condemnation of his colleagues.

Among the practices of the seventeenth century was the "sympathetic" treatment of wounds. Here the wound itself was washed with water and covered with a linen bandage. But to the weapon which had caused the wound a healing "sympathetic" compound was applied. Paracelsus originated a "weapon salve." Digby's "sympathetic powder" became famous.

The eighteenth century produced no marked advancement in the evolution of surgical dressings. Sporadically antiseptic substances for application to wounds were suggested, but were not generally accepted. Among these were sulphurous and lead lotions. In 1765 Pringle called attention to the use of cinchona bark as possessing the power of preventing wound putrefaction. This was later confirmed by several investigators and its use was carried down almost to our time.

It has been stated that medicine and surgery, including the art of wound treatment, "made more progress in the nineteenth century than in all the centuries preceding." It was in this century that the microbes which were the cause of disease, wound inflammation and suppuration were caught and convicted. The journey which led to the surgical revolution of this century was a long one. Finally, Pasteur showed that the fermentation of wine and beer was due to living organisms. The idea that suppuration in wounds and infective diseases were due to the same cause naturally followed. Out of this was born a new method of dressing and treating wounds—a new surgery.

*(To be continued)*

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## GIFTS OF THE GODS TO PRIMITIVE MAN.

BY JOHN THOMAS LLOYD.

It has been said that every vegetable drug in our materia medica was first used in medicine by the aborigines. Perhaps such a statement is too all-embracing,

possibly a few were left for the white man to discover. But certainly in the New World, at least, the native people knew and employed as medicine the greater number of the indigenous drugs that are known to the white man to-day. But how, it may be asked, did the primitive and ignorant red men come into possession of such broad knowledge of the medical flora; and why, if they knew so many drugs, do we not have greater knowledge of their manner of employing them? In tracing an American drug to its first records, why do we usually find the bare statement that "it was first used by the Indians," with no explanation as to whether it was used as powder, infusion or decoction, strong or weak? Why were their pharmaceutical methods, necessarily primitive, not more frequently recorded?

In the *National Eclectic Quarterly*, September 1921, my opinion was expressed regarding the probable manner in which the Indian gained much of his knowledge of medicinal plants. I will here briefly remind the reader that the white man's systematic knowledge of medicine, since the days when he relied more upon pure sorcery and witchcraft than upon observation of drug action, dates back but a few generations—or a few centuries at most. The Indian's knowledge, though often mixed with sorcery, was acquired through intimate association with Nature from the day of his earliest impressions to the day of his death. His very existence depended upon his knowledge, not only of what was good and palatable food in times of plenty, but more upon what roots and seeds could be eaten in times of scarcity. In trying all, as he must have done to carry him through times of famine, or to add variety to a monotonous diet, it is small wonder that he detected and came to recognize plants that produced unusual sensations or that relieved ailments from which he suffered.

Unfortunately for the preservation of records of the Indian's use of medicinal plants, his magic and therapeutics are often so intimately associated that it is impossible for us to separate the practices founded on true observation of results from those founded on pure superstition. Magic and medicine to him were almost or quite synonymous. In his language both are expressed by a single word—a word that differs but little from our own word, *prayer*. On this account it is a common inference that his ignorance is sufficient cause to disqualify the drug he used.

On our western desert, late summer dances with snakes and drums and grotesque masks may be serious petitions for the ending of drouth. In eastern forests singing medicine men with wolf-like masks may administer Podophyllum root from a plant that was approached from the east, encircled three times and finally red beads dropped in the holes from which the root was dug. Superstition this may seem to us, but to the Indian it is prayer to the Divine Power as serious as if the shaman chanted in an atmosphere of incense while robed in sacred vestments in place of animal masks and skins. If physic followed the administration of the Podophyllum it clearly indicated that the invading disease-causing demon was expelled by the ceremony, just as rain following the snake dance indicated that the gods were pleased and granted the appeal for moisture.

One can learn but little of the ways of the Indian without realizing that every act was interwoven with charm and fetish. The sowing of corn was preceded and accompanied by dance and ceremony lest the grain blast and wither. The gathering of the crop was accompanied by ceremony of thanks and rejoicing.

“Once when all the maize was planted,  
 Hiawatha, wise and thoughtful,  
 Spake and said to Minnehaha,  
 To his wife, the Laughing Water:  
 You shall bless tonight the corn-fields,  
 Draw a magic circle 'round them,  
 To protect them from destruction,  
 Blast of mildew, blight of insect.”

While the hungry tribe looked on and waited, the first ears from the fire were ceremoniously sacrificed to the gods.

Even the personal doings of the Indian were governed by charms and magic. There were charms to turn arrows, charms to protect the traveler, charms for the safety of those left at home. For the Indian there were no natural laws to account for that which the brain could not comprehend. The sun, the stars, the earth, the waters, health, disease, famine—all were mysterious gods, or the gift of gods whose favor must be courted or wrath appeased, by the proper magic or medicine.

Probably it is fundamentally on account of the white settler's lack of sympathy and understanding of these Indian superstitions that so little of what he knew and did is now known. The early missionaries found the native ceremonies (strange mixtures of empirical learning and pure superstition) in conflict with their teachings, so drove them to seclusion. The less serious-minded trappers and traders often found the dances and rituals mirth-provoking. Quite naturally neither gained the confidence of the proud first Americans.

Even to-day there are men of science who question the worth of a medicine that originated with the ignorant and superstitious savages. These men seem to lose sight of the fact that the dance for rain comes in the late summer just before time for the desert to blossom, and the administration of *Podophyllum* accompanied the ceremony to drive away the demon of disease. “We must admit,” says James Mooney, “that much of their practice is correct, however false the reasoning by which they have arrived at their results.”

The dance to the gods was considered as important at seed-time as the planting itself. Yet do we say that corn is worthless? Has the white man with all his knowledge of plant breeding ever bred products of greater value than corn, potatoes, tobacco, beans, squash, pumpkin, peanuts, or has he induced plants to progress farther from their primitive ancestry than these plants have progressed under the influence of pagan superstition and worship?

If at first thought one believes the aborigines, without laboratory facilities and without technical training, could make no discovery that would stand the test of the modern physiological laboratory, let him consider the early uses of almost any of the vegetable drugs classed as habit-forming stimulants or narcotics. Nicotine, for example, occurs, with but one known exception, in plants of the genus *Nicotiana*. The exception is the Australian plant, *Duboisia Hopwoodii*. Curiously enough the leaves of *Duboisia* are chewed by the Australian natives in much the same way that tobacco is chewed by its addicts. Yet the effects of nicotine are so imperfectly understood that there is more than a little doubt in scientific circles as to whether it contributes any important part to the pleasure of the tobacco user.

Another example is the well-known water-soluble alkaloid, caffeine. Caffeine, as we all know, is a stimulant so mild that its exhilarating effects pass almost or

quite unnoticed. It cannot be detected by flavor for it is practically tasteless. Caffeine occurs in comparatively few plants, among which the best known are tea, coffee, cocoa, kola, maté and guarana. These plants are of dissimilar appearance and are native to widely separated parts of the earth, yet every one of them was independently discovered by primitive man, and those on the American continent, at least, are prepared by their discoverers with pagan rituals. Civilized man isolated the alkaloid, caffeine, thousands of years after primitive man discovered its source and uses.

Is one to believe that the savages subjected every plant to tests careful enough to disclose the mild effects of caffeine? Stupendous as such a task would prove, is it not difficult to understand by what other means the caffeine-bearing plants could have been discovered among the thousands of dissimilar forms of vegetation? And, is it not logical that the process which made them known would also reveal other plants with other medicinal qualities? Should even the most technically trained persons question the worth of any medicine solely because it was first employed by the savage? If this logic were applied to foods, what dishes would appear on our daily table?

Not only have native tribes discovered medicinal plants, but they have discovered even more remarkable manipulative processes which make useful qualities available, or hold in check qualities that are detrimental, or alter drug structures to develop qualities that are not present in the natural state. This is pharmacy of the highest order. It antedates pharmacy of the European civilized nations by untold centuries.

To illustrate we need but consider a few of the caffeine-bearing plants already mentioned. Of these, tea leaves undergo careful "curing," while coffee, guarana, cocoa and kola are subjected to roasting before they are fit for use. In addition to roasting, cocoa also undergoes a period of fermentation.

Tobacco likewise must be cured before there is the slightest suggestion of the aroma that has perfumed the atmosphere of all civilized countries since Sir Walter Raleigh smoked the Indian weed to the astonishment of Queen Elizabeth.

Coca, the plant from which cocaine is derived, has been so long under Indian cultivation that the wild plant from which it descended can no longer be determined. In using coca, lime is invariably mixed with the leaves. Under its alkaline influence the alkaloids of the plant are insoluble, which suggests doubt whether "coca chewers" are in reality "cocaine eaters."

Several of the plants named are among our most important economic products. Great industries in every civilized country are founded upon their production and distribution. Yet, in their natural state, they are absolutely unfit for use. There is nothing about them that could possibly indicate that aromas and flavors could be developed and their natures completely altered by processes of roasting or curing. Had the discovery of their hidden qualities and the pharmacy necessary to bring them out been left to the white man, it is doubtful whether one of them would to-day be of more than taxonomic botanical interest. The pharmacy of the aborigine discovered and developed hidden qualities of natural vegetable products just as his plant and animal breeding developed foods without which man would necessarily be dependent upon wild things for sustenance, and his crowded civilization would be impossible.