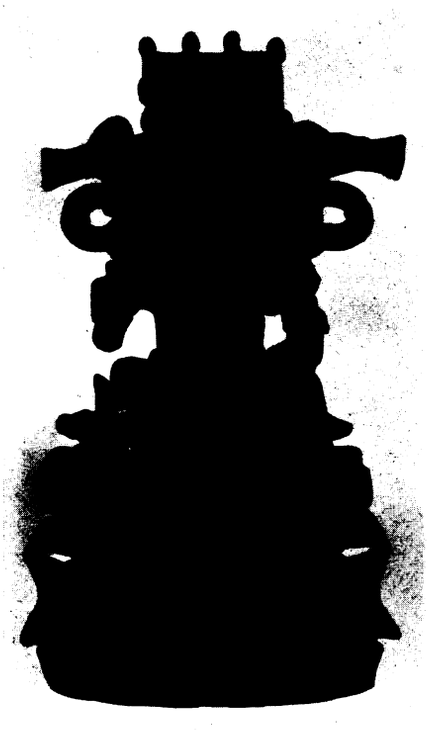

FOR INCENSE

From the mouth and armpits of the odd figure issued incense when it was used in the rites of ancient Mayas.

"Apparently the highland region was much more of a highway for trade and migration than the densely jungled lowland country. Consequently intensive work on the sites of the region can be expected to provide extremely valuable information as to the chronological interrelation of the various ancient cultures, particularly as it is probable that stratified remains will be discovered." *Science News Letter, August 29, 1936*

MEDICINE

Heart Failure Explained By Deranged Cell Chemistry

STUDY of the chemistry that goes on in the individual muscle cells of the human heart has suggested and supported a fundamental explanation of heart failure.

This important advance in medical knowledge was made in research by Drs. George Herrmann, George Decherd, and associates at the University of Texas School of Medicine, in Galveston.

Heart failure, these investigators reported to the Southern Medical Association and the American Heart Association, is fundamentally a disturbance in the breaking down and rebuilding by the individual heart muscle cells of a chemical called phosphocreatine. This biochemical derangement makes the heart muscle cells less efficient engines of contraction, with the result that the heart fails at its job of pumping blood out through the body.

Inadequate supply of oxygen to the individual heart muscle cells may start these serious chemical changes in the heart muscle cells. In patients with chronic heart disease, anoxemia or deficiency of oxygen content in the blood is the chief causative factor of the pathological chemical changes that weaken and finally exhaust the heart muscle. The administration of oxygen may temporarily postpone these chemical changes.

The chemical basis for contraction of skeletal muscle, previous investigators have found, is a phosphocreatine compound. When this chemical is built up in the muscles from potassium, phosphates and creatine, it becomes a powder barrel of energy, which when touched off is transformed into muscle contraction.

The Texas University investigators have gone into this fundamental problem and have made a study of the chemical makeup of hearts from patients who had died in heart failure. They corroborated the evidence that there is in such hearts a great decrease in creatine, from which it is logical to conclude that during life the phosphocreatine content was abnormally low. Potassium and phosphate were likewise found to be decreased.

The problem was then attacked from the experimental point of view and damage to the heart muscle was produced in various ways and the effects of the damage on the creatine content, as well as the other chemical constituents, was determined. Tying off one of the large arteries which supplies the heart, a condition which experimentally reproduces the effect of coronary thrombosis in human beings, showed conspicuous losses of glycogen, phosphate and creatine in the heart muscle from the area to which the blood supply was cut off.

Heart damage was furthermore produced by injections of combinations of

substances that have been shown to be followed by visible histological changes. Caffeine and adrenalin were used and the hearts from such animals again showed very striking decreases in the creatine content.

Further studies on the isolated beating heart of the rabbit corroborated the fact that creatine is lost as the isolated heart fails. These hearts, beating outside of the body, nourished by a special solution, showed uniformly low creatine values that were strikingly low when some of the small heart vessels to the heart wall were obstructed. The addition of various amino-acids to the solution was tried in the hope of finding a precursor of creatine that would make up for its loss, or spare what creatine was present in the isolated heart. Alanine alone of all the amino-acids seemed definitely to act as a sparer, while glycine, or glycocoll, which has been used in other human muscle disorders, was next best preserver of creatine. These same amino-acids have been used in patients with heart failure with only slightly encouraging results. The administration of glycocoll has not been found to have done anything more than decrease the sense of bodily weakness in patients with heart failure. Forced oxygenation by mass action accomplished by placing the patient in an atmosphere rich in oxygen has often saved life. Glucose and insulin were of no avail experimentally while they have often seemingly benefited patients in heart failure.

Acidosis, or increased acid in the nourishing solution, a state that results from oxygen deficiency particularly with the overproduction of lactic acid, was shown to increase the loss of creatine from heart muscle cells and thus weaken the organ.

The use of digitalis in the experimental animals seemed to conserve the creatine of the heart. Digitalis, which has long been thought to increase the tone of the failing human heart, now has chemical evidence in favor of its direct action on the heart muscle action.

Science News Letter, August 29, 1936

ZOOLOGY

Attempt to Save Orang, Python and Dragon-Lizard

TRAVELOGUERS, regaling us with tales of "bringing 'em back alive," have somehow left us with a pretty general impression that the Malayan region is still a brimming reservoir of wildlife, with orang-utans, tigers, water buffalo, and pythons ready to pop out at you at every turn of the jungle trail.

Such, however, seems not to be the case at all. Southeastern Asia, and especially the Netherlands Indies, are giving anxious conservation problems to the European powers charged with administrative responsibility. Desirable laws and their workability, game refuges and their suitability, and most of all field research looking toward more intelligent handling of existing and future problems, are illuminatingly discussed in a bulletin of the Netherlands Commission for International Nature Protection, which has been translated into English as a special publication of the American Committee for International Wild Life Protection.

The tropic East Indian islands that constitute the chief jewels of the Netherlands imperial crown stretch through more than fifty degrees of longitude, just north of the Equator, from Sumatra on the west to New Guinea on the east. Their very names are romantic poetry: Java, Celebes, Ceram, Flores, Timor, the Sundas, the Moluccas—lands that Sindbad knew.

Their fauna is no less provocative to the imagination: orang-utan, gibbon, simiang, tiger, leopard, panther, Malay bear, Sumatra elephant, rhinoceroses with one horn and with two. Here are the famed dragon-lizards of Komodo, the giant pythons, terrible in tales but harmless in fact, the formidable-looking but highly edible iguanas. Here, too, is the narrow Wallace strait, separating Lombok from Bali, famous in evolutionary science long before cameramen and tourists discovered the comeliness of the native women.

Over all this vast faunal realm, like a modern but still anxious Noah, watches the government of the Netherlands Indies. Emulating the example set first when Yellowstone National Park was established by the United States, and brilliantly seconded by such governments as Belgium and Britain in Africa, the careful Dutch have set aside special reserves for orang-utans in Sumatra, and for the almost extinct scaly rhinoceros at the very western tip of Java.

Elsewhere, regulations of hunting and trapping have been promulgated, and repealed on occasion in favor of more practicable ones where it has been found necessary. Research is showing that some animals can get along on less protection than they now have, but that others need more. Some species have already begun to show the effects of scientific intervention on their behalf, but others are still retreating before the onslaughts of hunters, and even more before the felling of the forests by plantation corporations. It is heartening, however, to know that action is being vigorously and actively conducted on this sector of the world-wide battle for the conservation and restoration of wildlife.

Science News Letter, August 29, 1936

RADIO

September 1, 2:15 p.m., E.S.T.

SCIENCE IN HARVARD'S TERCENTENARY—Watson Davis, Director of Science Service.

September 8, 2:15 p.m., E.S.T.

ONE THOUSAND USES FOR WOOD—G. W. Trayer of the U. S. Forest Service.

In the Science Service series of radio programs over the Columbia Broadcasting System.