SCIENCE NEWS

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THE USEFULNESS OF LABORATORY RESEARCH

UNPREDICTABLE by-products of research in physiology are rarely brought to the attention of the layman. The studies which led to the appreciation of liver as a food to promote hemoglobin regeneration were taken up with no idea of any clinical application. We wished to find out how the body built up hemoglobin and what materials could best be utilized by the body.

These studies are still being carried forward to determine what elements of food are most essential to make new hemoglobin. Dogs are best suited for these studies and all work has been done on these animals. They are frequently used to standardize liver fractions to be used in the treatment of human disease.

Future progress in the control of other diseases can not be predicted with any certainty but if history has any significance it points to future by-products coming from investigations in the wide field of pure science which will enable the physician to bring under control still other diseases which afflict human kind.

It is never safe to state that any bit of accurate knowledge about body physiology is useless for in the future some student may sense its application to the study of some particular disease state. Progress is often made by way of detours which look very unfavorable at first.

GEORGE H. WHIPPLE

UNIVERSITY OF ROCHESTER

THE CONQUEST OF PERNICIOUS ANEMIA

ONCE when a doctor shook his head and said "pernicious anemia," it was a death warrant executed in two or three years by the slow progress of this blood disease. In 1926 the medical world was thrilled, as it is occasionally by some great advance, by reports from the Harvard Medical School that liver, the ordinary calf or beef liver of that tasteful liver and bacon dish, was capable of conquering pernicious anemia. To-day the disease fighters who made mankind unafraid of one more disease are honored for their work by that highest of science's awards, the Nobel prize in medicine.

As insulin subdued the toll of diabetes, so liver is a specific for pernicious anemia. And as the achievement of insulin was crowned by a Nobel award to the group responsible, so liver for anemia is now recognized.

Like many great discoveries in science, the conquest of this disease of the bone marrow, a disease that prevents the formation of enough vigorous red blood cells, came slowly. The first act occurred in the animal experiment laboratories of Dr. George H. Whipple, of the University of Rochester. The second act of the drama came when Dr. George R. Minot, of Harvard Medical School, seized upon Dr. Whipple's results and reprieved by the grace of science pernicious anemia patients.

It seemed simple after it was done. The patient ate large quantities of liver—as much as half a pound a day. That is, it was simple if the patient happened to like liver, which most of them did not. Since then the treatment is dietetically less heroic for the material in liver that does the work in counteracting the disease has been extracted and it is only necessary for the patient to take relatively small doses of the extract. But in the early days, the patients ate liver and they had to like it. One incidental effect when the news got around was that perfectly well people who did not need to eat liver to save themselves from death decided to eat more liver. And the price shot upward under increased demand which did not help the economics of combating the disease.

Within the first four years after announcement of the treatment in 1926, life insurance statisticians found that the mortality from this disease for white persons had been reduced by about half between the ages of 55 and 74 years, in which range formerly the heaviest mortality from this disease had occurred. At the same time, pathologists in medical schools were finding themselves hampered in their teaching because they could not find a sufficient number of patients suffering from the disease to be used in showing medical students how this disease affects the body!

Perhaps it was because he suffered from diabetes and thus learned first-hand the vital importance of scrupulous attention to diet that Dr. Minot discovered the value of liver in treating pernicious anemia. According to reports it was while he was weighing every morsel of his own food, before the discovery of insulin, that he began to investigate the eating habits of his pernicious anemia patients. He found them finicky eaters, over-fond of fats and disliking meat and other protein foods. Then he heard of Dr. Whipple's laboratory experiments.

Dr. Whipple had given dogs another kind of anemia—simple anemia—and had found that feeding liver or muscle meat cured their anemia. Dogs do not get pernicious anemia, and the two kinds—simple and pernicious anemia—are quite different. Furthermore, muscle meat such as beefsteak had never helped pernicious anemia patients. Still, Dr. Minot decided to give liver a trial, perhaps spurred on to this decision by the knowledge that liver was being found valuable in pellagra and sprue, two diseases which had certain similarities to pernicious anemia.

The striking improvement in the first liver-fed pernicious anemia patients seemed too good to be true, so Dr. Minot enlisted the unprejudiced aid of another practicing physician, Dr. William P. Murphy, of Harvard Medical School. Without telling Dr. Murphy much about his own results and hopes, he persuaded the latter also to try liver feeding for pernicious anemia. When Dr. Murphy's liver-fed patients showed the same striking improvement, Dr. Minot felt sure enough of the method to make the first public announcement at a scientific meeting.

SEARCH FOR AN ANTI-INFLUENZA SERUM

AN anti-influenza serum has been produced in a horse by the three British investigators who last year isolated the influenza virus. The same scientists have found a way of systematically using mice, the most widely available animals for medical research, for their intensive experiments in the long-continued war against flu.

This dual announcement is made in the current issue of *The Lancet*. The three scientists are Drs. C. H. Andrewes, P. P. Laidlaw and Wilson Smith, all of whom are working at the National Institute for Medical Research Farm Laboratories, at Mill Hill, a suburb of London.

Dr. Laidlaw was last November awarded the Royal Medal of the Royal Society of London for his part in discovering a vaccine for protecting dogs from distemper, which is believed to be the canine counterpart of flu. The isolation of the influenza virus reported last year, since confirmed in America by Dr. R. Shope, of the Rockefeller Institute at Princeton, N. J., resulted from their having previously discovered that ferrets are susceptible to infection with human influenza.

The extreme importance of this discovery was due to ferrets being the first animals in which systematic infection with human influenza was shown to be possible. Before last year it had seemed to many investigators that the only way to tackle the flu problem thoroughly was to call for human volunteers, who, living for the time as laboratory animals, would allow themselves to be deliberately infected with the disease so that its cause, cure and prevention might be intensively studied, and who might, of course, die. Earlier experiments with apes and monkeys had occasionally given hope that these animals might be used for this purpose, but further trials had proved that results were negative more often than not, and that certainly no dependability of response to infection could be expected.

Rapid progress has followed the use of ferrets. What is at present its zenith is referred to in the current *Lancet* report quite briefly only. Drs. Andrewes, Laidlaw and Wilson Smith state that five mice given mixtures of virus and undiluted serum—the serum from a horse which had been hyper-immunized with tissue from ferrets that had been infected with a strain of human influenza—survived, while five controls all died. Last year's discovery enabling ferrets to be infected with flu was an essential step in the obtaining of the serum from a horse.

Details concerning this horse serum will be published later. For the moment medical men and laymen alike have to wait as patiently as possible for the promised full account of what may prove to be one of the most important medical advances for many years.

A NEW PITUITARY GLAND PRODUCT

DISCOVERING a new hormone from the body's master gland, science may have a clue to the cause of stomach ulcers. The new product of the pituitary gland seems to stimulate the stomach to pour out increased amounts of hydrochloric acid. This discovery has just been made and reported by scientists at the Courtauld Institute of Biochemistry of the Middlesex Hospital of London.

It may mean that it will be found that a disorder of the pituitary is the cause of stomach ulcers. Excess hydrochloric acid is found in cases of stomach ulcers. This excess acid is believed by some scientists to be a cause or part of the cause of this condition. The London discovery also ties in with the finding of an American scientist, Dr. Harvey Cushing, that stimulating the base of the brain near where this gland is located may produce stomach ulcers.

The new glandular product comes from the hind part of the pituitary gland. It was discovered by Drs. E. C. Dodds, R. L. Nole and E. R. Smith. With characteristic scientific reserve and caution, they report in the current issue of *The Lancet* that their findings "suggest the probability of a new posterior pituitary hormone." They call it a "factor."

They think they have discovered either a new hormone or a new, hitherto undiscovered property of an already known pituitary hormone which affects blood pressure. The editor of *The Lancet* considers the new substance more likely to be an entirely new hormone.

In their investigations a special extract from the hind or posterior part of the pituitary gland was injected under the skin of forty rabbits. This produced marked injuries in the fundus or acid-producing area only of the stomachs of all the rabbits. The same effect was obtained when the rabbits were fed very large doses of the standard posterior pituitary extract prepared according to the directions of the British Pharmacopeia.

The doses given both by mouth and by injection under the skin were so large that the newly-discovered factor that injured the rabbits' stomachs would appear to be negligible in the ordinary doses of posterior pituitary prescribed for patients. What effect the new hormone has on the body in the small quantities normally produced by the pituitary gland is not yet known with certainty.

CORNELL EXPEDITION TO THE NORTH-WEST COAST AND THE PTARMIGAN CHICK

BY DR. FRANK THONE
Science Service Editor in Biology

THE first "Eskimo chicken," or ptarmigan, ever to be raised in captivity was described before the Chicago meeting of the American Ornithological Union, by Professor A. A. Allen, of Cornell University. Although now living far to the south of any country known to ptarmigan, at least since Ice Age times, this friendly little bird of the Arctic has adapted itself well to its environment, and has not presented any infancy troubles beyond those shown by the more familiar ruffed grouse, which has already been raised in captivity by Professor Allen.

The bird is now changing into its winter white coat of feathers, and is at present in a sort of half-and-half uniform—dark summer plumage above and winter white underneath. Moulting in this species differs from that

in other birds in that it seems to be a continuous process throughout the year.

The rearing of this ptarmigan chick on the Cornell University campus was one result of a three-thousand mile expedition to Churchill, Manitoba, on which Professor Allen was sent last June, under the auspices of the Grouse Investigation Committee of the American Game Association, to further the studies of the ruffed grouse which he has been making for many years.

On the expedition a high spring mortality among the ptarmigan was noted, and an almost complete disappearance of lemmings, small animals of the rabbit-squirrel family. Professor Allen would not undertake to pass on the causes of these seeming fatal plagues however, until pathological specimens collected at the time can be given careful study.

At the same session one of Professor Allen's colleagues reported on other phases of scientific bird study. Dr. George Miksch Sutton, curator of birds at Cornell University, told of the work of a joint expedition to the Vancouver Island region, on the coast of British Columbia, undertaken by the university and by the Carnegie Institution of Washington. After several weeks of work in the coastal straits and inlets, the party, known officially as the John B. Semple Ornithological Expedition, moved inland over the mountains and into the drier country.

Two outstanding achievements of the expedition were the collection, for the first time in forty years, of the first positively identified and perfect egg of the marbled murrelet, a small water bird, and the collection of a black pigeon hawk.

Dr. Sutton reported a wanton slaughter of bald eagles by the Siwash Indians, who sell the wings for a dollar apiece and the tails for fifty cents. These trophies find their way southward and inland, being used by the Plains Indians and the Pueblos and Hopis of the Southwest for the "millinery" the braves still affect. By the time the feathers reach the Pueblo-Hopi country, in the hands of white traders, they are priced at a dollar each. Dr. Sutton also called attention to the need for better-enforced protection for the rare trumpeter swan in the Knight's Inlet region, which are being mercilessly hunted.

ITEMS

SOUND reflectors, similar in principle to those used by military forces to detect approaching airplanes, are given much more peaceful employment by Paul Kellogg, of the laboratory of ornithology at Cornell University. Before the meeting of the American Ornithological Union in Chicago, he demonstrated how he has been using a highly directional parabolic reflector with an exceedingly sensitive microphone at its focus, to capture the songs of birds in the field, and give them permanent phonographic recordings.

MORE than a million marshes and small lakes spread over the vast uncultivated northern wilderness of Canada, constitute this continent's last great breeding-ground and refuge for ducks, geese and other wild-fowl of the waters. A survey of this "duck-heaven" was presented before the meeting of the American Ornithological Union at Chicago by Edward A. Preble of the U. S. Biological Survey. In pre-settlement days, Mr. Preble said, wild-fowl bred as far south as Iowa. Then came farmers who plowed and drained, hunters who shot recklessly, first over the prairies and plains of the United States, finally far up into the great grasslands of Canada. Now the ducks must make long flights, from northern Canada to the Gulf Coast region, and the wild-fowl problem is a major job of international adjustments.

A NEW way of fighting peritonitis, the often fatal infection which may follow abdominal operations, was demonstrated to surgeons attending the clinical congress of the American College of Surgeons in Boston by Dr. Edward L. Young, surgeon-in-chief of Faulkner Hospital and on the surgical staff of Massachusetts General Hospital. By this method death following surgical removal of part of the digestive tract was reduced from 30 per cent. to 2 per cent. The method was originated by Dr. Herbert L. Johnson, of West Roxbury and Boston. It consists of injecting into the abdomen what Dr. Young called a "concentrated fraction of bovine amniotic fluid." At first it was used at the time of operation but now is injected four to six hours before. This fluid, now obtained from cows at the time their calves are born, apparently has the power to stimulate healing in the abdomen and resistance to infection.

CASES of skin cancer caused by arsenic-containing medicines taken for other conditions have caused Drs. Clifford C. Franseen and Grantley W. Taylor, of Boston, to issue a warning to physicians to be cautious in giving arsenic as medicine. Nine cases definitely due to arsenic and five more cases probably caused by arsenic are reported by them in the current issue of the *American Journal of Cancer*. In two of the cases, the patients had been exposed to arsenic in the form of a spray for fruits and vegetables. But arsenic given as medicine for the relief of skin diseases and blood disorders caused the cancerous condition in the majority of the cases.

SUGAR made from wood will not be a positive contribution to Germany's economic recovery, but the exact opposite, declares Professor O. Spengler, director of the Institute for the Sugar Industry, with headquarters in Berlin. Wood can be turned into sugar on a large scale by the well-known Bergius process, he admits; it can even be done at a financial profit. Professor Spengler's contention in opposition is based more on what he claims is wood's lower food productivity per acre as compared with the yield of sugar beets. According to his figures, one hectare (about 2½ acres) of land in sugar beets will support 20 persons, under German conditions of cultivation. The same area in potatoes will support 10 persons; in wheat only 6. He does not give figures of the supporting capacity of land in trees destined to become sugar, but implies that it is even lower than that of wheat acreage. He contends, therefore, that to substitute wood sugar for beet sugar in Germany would aggravate the already troublesome agricultural unemployment problem. Professor Spengler's figures and arguments are given in detail in the German science journal, *Die Umschau*.