

MEDICINE

Chlorophyll for Healing

Green Pigment from Plants Now Used Experimentally For Treating Wide Variety of Diseases and Infections

By LOIS MATTOX MILLER

DEEP in the mysterious affinity between sunlight and the earth's green plants, science hopes it has found something which brings man closer to victory in his old struggle against bodily infection. New to medicine, this substance probably is as old as life itself. It is simply chlorophyll, the coloring matter with which Nature paints forest, field, and garden a brilliant green.

Don't be surprised if your doctor tells you that he has never heard of chlorophyll being used this way. The work being done is so recent that only a relatively small number of the nation's 175,000 physicians have heard of it. But evidence of chlorophyll's medicinal value is most encouraging, so far. Distinguished medical specialists report that in 1,200 recorded cases they have seen chlorophyll combat deep-lying infections, cleanse open wounds, relieve chronic sinus conditions, and banish common head colds. More remarkable, they say, is the way it accomplishes these things—speedily and effectively, with none of the harsh, irritating effects common to most antiseptics. Chlorophyll, the healer, is at once powerful and bland—devastating to germs and yet gentle to the wounded body tissues. Exactly how it works is still Nature's secret. To the layman, at least, the phenomenon seems like green magic.

Age-Old Puzzle

For ages men have puzzled over the question—"What makes grass green?" About a century ago chemists segregated the green pigment in growing plants and named it chlorophyll. But until 1913 all attempts to explore the chlorophyll molecule failed. Then a German chemist, Dr. Richard Willstätter, made uncannily correct deductions about it. He likewise pointed out that the green miracle of nature is a process closely linked to the secret of life itself.

All life energy comes from the sun. Green plants alone possess the secret of how to capture this solar energy, and pass it on to man and beast.

A ray of sunlight strikes the green leaf and instantly the miracle is wrought. Within the plant molecules of water and carbon dioxide are torn apart—a feat which the chemist can accomplish only with great difficulty and expense. First there are only lifeless gas and water; then, presto! these elements are transformed into living tissue and useful energy. Oxygen is released from the plant to revitalize the air we breathe. Units of energy, in sugars and other carbohydrates, are speedily manufactured and stored up in the living plant.

Out of the process stems much of what we know as life and growth. Man consumes the energy as food—both in vegetables and the flesh of herbivorous animals. He uses it in the form of coal, oil, and gas—green vegetation locked up in the earth for ages.

Like Blood's Hemoglobin

These facts deduced by Willstätter were dramatic. But closer study yielded something even more baffling. The chlorophyll molecule bears a striking resemblance to hemoglobin, the red pigment in human blood. The red blood pigment is a web of carbon, hydrogen, oxygen, and nitrogen atoms grouped around a single atom of iron. Nature's green pigment is a similar web of the same atoms—except that its centerpiece is a single atom of magnesium. Obviously, this similarity had some significance. But what could it be?

Thus the multiple mysteries of chlorophyll became a standing challenge to the imagination and genius of scientists. Some of them, including Charles F. Kettering, began to probe for the basic secrets of the "sun trap" hoping to find some artificial means of directly tapping solar energy. Still others, like Dr. Hans Fischer, a German who won the Nobel Prize in 1931 for his work on the red-blood pigment, searched for possible medical uses for chlorophyll.

Kettering set up a Foundation for the Study of Chlorophyll and Photosynthesis at Antioch College in 1930 and enabled a whole staff of scientists to explore the phenomenon from all angles.

One of the first questions the Ohio researchers asked themselves was—What happens to chlorophyll as it passes through the digestive systems of animals and human beings? They found that in partially digested grass the break-down product of the chlorophyll molecule bore an even closer resemblance to one of the fragments of red blood pigment, called hematin. And when this partly digested food was fed to rats it directly stimulated the formation of red blood cells.

At about the same time, Dr. Fischer in Germany announced that for some time he had been using chlorophyll in the treatment of anemia, with promising (although by no means conclusive) results. These clues from two divergent projects served to spur on the efforts of biochemists elsewhere, among them investigators at Temple University in Philadelphia.

Doctors there discovered a curious thing: the green solution seemed to thicken and strengthen the walls of the body cells of living animals. That logically led them to ask, might not chlorophyll be useful in helping the body to combat bacterial invaders?

Here was a medical need even more urgent than a new treatment for anemia. Years of research had produced a host of antiseptics; but, from the doctor's viewpoint, even the best of them shared a common drawback. An antiseptic solution strong enough to kill germs often damaged the surrounding body tissues. Obviously, the ideal agent would be something that enabled the body to make short shrift of bacteria, and at the same time was soothing to the tissues. Could chlorophyll be the answer?

No Power in Test Tube

Nature's green pigment was puzzling in the laboratory. It possessed no power of its own to kill germs; it would not perform in a test tube. But in contact with living tissues, it appeared to increase the resistance of the cells and inhibited the growth of bacteria, thus preventing the germs from spreading their poisons. Its peculiar faculty for breaking down carbon dioxide and releasing oxygen apparently spelled defeat for the bacteria which thrive only in sealed wounds away from air. And not the least of its advantages was the fact

that it could be applied in generous doses with soothing rather than irritating effects.

As the next tentative step, it is reported, the Department of Experimental Pathology at Temple extracted quantities of chlorophyll from green nettles, and prepared solutions and ointments suitable for a wide variety of infections. Then the medical specialists in charge of departments and clinics of the Temple University Hospital began to treat patients under carefully controlled conditions.

Announced in July

Last July the first report on the therapeutic use of chlorophyll was published in the *American Journal of Surgery*. Under these auspices, and with a score of distinguished doctors adding their own testimony, the green pigment was described as an important and effective drug. Some 1,200 cases, ranging from deep internal infections like peritonitis and brain ulcers to pyorrhea and skin disorders, had been treated and documented, and in case after case the doctors had been able to close their reports: "Discharged as cured."

People had been brought in to the hospital with bursting or infected appendices and spreading peritonitis. Appendectomies had been performed, and the task of checking the gravely dangerous infection had been left to chlorophyll. Chlorophyll solutions had been flooded into deep wounds through drainage tubes, and applied elsewhere on wet dressings or in ointments and salves.

Ulcerated varicose veins, osteomyelitis (a difficult bone disease), skin disorders,

and various types of infected wounds had been cured and healed. Applied in numerous cases of mouth infections, such as Vincent's angina and advanced pyorrhea, the results were immediate and positive. "The gums tightened up entirely," Dr. Homer D. Junkin commented, "and have remained clean since."

But the most spectacular results occurred in the treatment of chronic sinus infections and head colds. In 1,000 cases of respiratory infections — sinusitis, rhinitis, head colds, etc.,—treated under the supervision of Dr. Robert Ridpath and Dr. T. Carroll Davis, prominent specialists reported "there is not a single case recorded in which either improvement or cure has not taken place." Chlorophyll packs, skillfully inserted into the sinuses, it is reported, had a drying effect, cleared up congestion, and gave immediate relief. Congested head colds were cleared up within 24 hours.

How does chlorophyll affect the system? Beyond the theory that it strengthens the cells, inhibits bacterial growth, and gives the body tissues an opportu-

nity to apply their own defenses, these doctors are frank in admitting that they don't know. There is considerably more to the process than just that, they say. Its exact nature may never be understood fully. "It is possible," says one Temple pathologist, "that the bacteria, being of vegetable origin, yet possessing ordinarily no chlorophyll, undergo some biological change in the presence of the substance."

The experts who have nursed it through its laboratory period and clinical trials are enthusiastic; they freely predict its wider and more effective use by doctors.

The medical profession at large, conservative, and properly so, will study the effects of chlorophyll long and carefully before it recommends its general use. But there are increasing reports of hospitals and private practitioners who are making tests. They hope the early evidence that Nature's "green magic" heals as well as nourishes man, stands the ordeal of further trial. It is one of the most interesting lines of research on the frontiers of medicine today.

Science News Letter, March 15, 1941

PUBLIC HEALTH

Army Appoints Commissions To Fight Epidemics

THE ARMY's fight to keep epidemic diseases such as measles, influenza and meningitis out of training camps has been advanced by the appointment of five special commissions of civilian physicians to advise and aid the Army's own disease fighters.

Dr. A. J. Warren, of the Rockefeller Foundation's International Health Division, Dr. O. T. Avery, of the Hospital of the Rockefeller Institute, and Dr. Kenneth F. Maxcy, of the Johns Hopkins School of Hygiene and Public Health have been added to the main board of civilian physicians, of which Dr. Francis Blake, Yale University School of Medicine, is chairman. In addition the following have been appointed directors of special commissions:

Influenza: Dr. Thomas Francis, Jr., New York University College of Medicine.

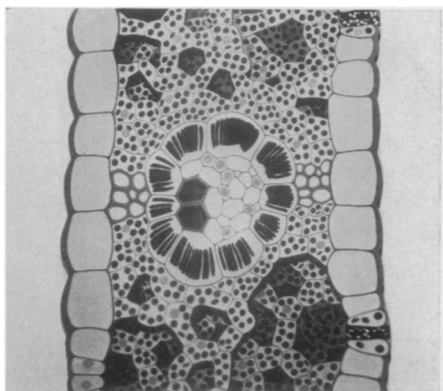
Epidemiological Survey: Dr. S. Bayne-Jones, Yale University School of Medicine.

Measles: Dr. Joseph Stokes, Jr., Uni-

versity of Pennsylvania Medical School. Meningitis: Dr. Perrin Long, Johns Hopkins University School of Medicine. Neurotropic Virus Diseases (this would include infantile paralysis and encephalitis or "sleeping sickness"): Dr. John Paul, Yale University.

Appointment of directors of two other special commissions and members of the commissions is now under way.

Science News Letter, March 15, 1941



CHLOROPHYLL

In this cross section of a corn leaf is shown where chlorophyll is found. The little black dots are the chlorophyll bodies.

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