and the effect seems worthy of comparison with that previously described. Conditions under which I was stung were comparable, to the extent that both times I was in good health and accustomed to the stings of numerous kinds of ants.

June 25, 1938, at 2:19 P.M., while excavating the nest of the ant *Sericomyrmex amabalis* Wheeler, I felt a sting comparable to a severe wasp sting on the skin at the junction of the middle and upper third of the left forearm opposite the medial aspect of the biceps muscle. I was wearing a short-sleeved jacket and reflexively brushed the sleeve, whereupon a dealate female *Paraponera clavata* 27 mm. long tumbled to the ground. She had climbed up the sleeve as it momentarily touched the ground and the course of the sting could be followed into the skin as a reddish line 2–3 mm. long on a slight edema resembling that following a mosquito bite. No reaction of the surrounding tissues other than those described above had occurred eight minutes later. At 2:41 an urticarial-like lesion with a central edematous area 2 mm. in diameter and an erythematous halo approximately 40–50 mm. in diameter had appeared.

There was a dull, burning sensation associated with the lesion. By 5:00 P.M. an oval area fully 150 mm long on the inner surface of the forearm was reddened peripherally. A distinctly yellowish edematous area about 100 mm long occupied the center of the reddened area. The burning sensation continued. No systemic reaction was noticed and there was no evidence of lymphangitis extending toward the axilla nor any tenderness or enlargement of the axillary lymph nodes at any time. At 7:30 the lesion was disappearing, though the burning sensation was still present. No medication was applied to the lesion at any time, except that the customary evening shower with soap was taken just before 5:00 P.M. The next morning the area was slightly reddened but not painful. The process gradually disappeared, leaving the arm completely normal.

The effect of this sting of the Panamanian ant strikingly contrasts with that of the Guianan ant previously described. Both belong to the same species and have not been separated, even as different subspecies or varieties, though numerous specimens from both Central and South America have been examined by myrmecologists. The fact that it was a female and not a worker ant which stung me in Panama means that fully as much, if not more, poison was probably injected. Female ants are larger and commonly the sting is more intense than in workers. She had every opportunity to inject a full dose of poison directly into the flesh, while the Guianan worker stung through heavy khaki cloth and was brushed off almost at the time it started to sting. The Panamanian sting, on the medial surface of the forearm, was in an ideal place to be absorbed quickly into the axillary lymph nodes and produce systemic disturbances, while the Guianan sting was over the patella where the blood supply and drainage would be relatively poor.[4] Yet in the Panamanian sting recovery was complete in a few hours; in the Guianan it took over a week.

This difference in virulence of sting in the same species of ant suggests a physiological difference unaccompanied by obvious morphological characters which seems not to have been recorded among ants or related insects.

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is common in the rain forests of this region. Nesting and other habits are essentially similar to those in South America. This species excavates irregular chambers a few centimeters in diameter in the soil at the base of a tree, frequently a buttressed tree. From the nest a soil-covered chimney several centimeters in diameter is usually built to a height of sometimes 10–30 cm. This chimney may be washed down during heavy rains, leaving an opening to the nest occasionally 10 cm in greatest diameter. When their tree is sharply rapped or when the surrounding soil is stamped the ants come "boiling" out and wildly dash about in search for the disturber. Any moving animal in their path is viciously stung. Those ants of a Panamanian nest did not climb trees in their search for a disturber higher than 60 cm, usually about 10 cm. In South America I often found them climbing trees to a height of two meters.

A REVERSED CRYPTOBRANCHUS

A RECENT article in SCIENCE by Helen A. Wragg on a reversed cat leads to this brief report on the same situation in a large female Cryptobranchus. It was discovered this fall during routine laboratory dissections. As far as can be ascertained, the reversal is complete, with stomach and spleen on the animal's right rather than on its left side. The position of the gall bladder and duodenum has shifted to the left. This condition not only shows itself in the digestive tract, but is obvious in the position of the heart within the pericardial sac, and the relation of the portions of the heart to each other. It is reflected again in the distribution of the intestinal blood vessels. The animal was a perfect specimen and all organs were normal in size and appearance.

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VEGETATIVE REPRODUCTION OF SQUASH TYPES

VEGETATIVE reproduction of squash types, *Cucurbita* spp., has been developed and is now being used to sup-

[4] This probably accounts for the localized lesion which resulted compared with the severe systemic disturbance produced by stings in other parts of the body in the usual South American case.

plement sexual reproduction methods in our squash-breeding studies in Puerto Rico. Vigorous 5- to 7-node cuttings with swollen root buds at several nodes have rooted and successfully established normal plants under field conditions; under favorable soil-moisture conditions in the field, successful propagation in as high as 90 per cent. of the cuttings was not unusual. All leaves on each cutting were left intact, the youngest leaf being usually approximately one third full grown. On planting, the entire cutting was covered with soil except the youngest leaf and the vegetative growing point subtended by it. No shading was required nor was the application of growth-promoting substances or other special growth aids necessary. It was observed that plants thus propagated grew more rapidly and fruited earlier than plants produced from seed.

This vegetative propagation permits the rapid and easy establishment of clonal lines of squash and facilitates physiological studies for which plants with a high degree of uniformity are essential. By making possible the immediate propagation of superior commercial types of greater uniformity and higher quality this method of propagation has an economic application in the tropics and subtropics, where heterogenous populations of squash exist.

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BOOKS AND LITERATURE

Sulfanilamide Therapy of Bacterial Infections. By R. R. MELLON, PAUL GROSS and FRANK B. COOPER. Charles C Thomas Company, Springfield, Ill., 1938.

THE background of the discovery of prontosil in 1935 by G. Domagk remains clouded in obscurity. Of the many prior compounds that must have been studied by Domagk, in collaboration with the chemists Mietzsch and Klarer at the I. G. Dye Works in Germany, we have no record.

The entire development has been characterized by hasty application of laboratory findings to clinical practice, a fault partially justified by the life-saving nature of the therapy in many cases. Soon after Domagk's announcement of prontosil, Tréfouel, Nitti and Bovet at the Pasteur Institute demonstrated that sulfanilamide was an active fraction of the prontosil molecule, and subsequent work has shown it to be more active and less toxic than prontosil.

Originally believed by Domagk to be specific for streptococcic infections, work from various laboratories showed that the following experimental infections could to varying extents also be influenced by this type of therapy: Meningococcus, pneumococcus, staphylococcus, typhoid bacillus, Welch bacillus. Clinical trial, followed by laboratory studies, brought the gonococcus and *B. abortis* within the pale of curative action. Slight action has been found upon animals infected with choriomeningitis virus, canine distemper virus, influenza virus and the virus of lymphogranuloma inguinale. Much optimism for the future of chemotherapy can be drawn from this imposing start and from the fact that some sulfonamide compounds exhibit special activity against certain of these infections. The infections against which the most marked action can be shown in the laboratory—streptococcus and meningococcus—have been the ones yielding the most favorable results in the clinic.

It was inevitable that a wide-spread search would be begun for new compounds, and a baffling number have already been reported in the scientific and patent literature. Drs. Mellon, Gross and Cooper list several pages of them, including the more active diphenyl sulfones.

Considerable space is devoted by the authors to the various phases of mechanism of curative action. Bacteriostatic effects of sulfanilamide have been demonstrated both in culture media and in body fluids. This effect, although definite, is weak. The rôle of neutralization of bacterial toxins and of interference with capsule formation remains to be established. There is general agreement that the drug acts on the organism in some way whereby the natural defense forces of the body are rendered better able to cope with the infection. Potentiation by the drug of the action of antiserum has been demonstrated both in culture and in the infected animal. More satisfying evidence is needed to clarify the mechanism of action, although it must be remembered that the problem of mechanism in the case of most other chemotherapeutic drugs has resisted attempts at solution. Interesting is the demonstration *in vivo* of the "antitoxin" action of some of these sulfur compounds.

Pharmacological and pathological studies of these new compounds have regrettably lagged behind therapeutic investigations, and such important issues as chronic toxicity effects and metabolic studies remain to be more fully explored. It has been established that excretion of sulfanilamide is chiefly through the urine, partially in the free state, and in some species (including man) partially acetylated. Excretion is rapid, and the major part of the drug can be recovered from the urine within 12 hours after an oral dose.

Experimental evidence of curative action for strepto-