

an unusual variant of juvenile rheumatoid arthritis or an infectious arthritis," and to realize "that at that point it became clear that it was beyond my realm of expertise." He called for reinforcements.

The pieces of a puzzle were becoming evident. He needed help to try to find more pieces before an attempt could even be made to fit them together. Stephen E. Malawista, Chief of Rheumatology and Allen C. Steere Jr., postdoctoral fellow in Rheumatology, both of Yale, were presented with the clues: Three to four weeks before the initial swelling, which is usually mild and intermittent, a semi-circular skin lesion or a rash appears, the kind previously associated with tick bites. The outbreaks have been clustered temporally (appearing in the summer or early fall) and geographically (Lyme and nearby towns). Though there were several cases within one family and among neighbors, they sometimes started in different years, making it unlikely that the disease was transmitted from one person to another. "Most of those with the illness lived in sparsely wooded areas," commented Steere. "Half of those affected in Old Lyme lived on two adjoining roads as did half of those affected in East Haddam."

Studying these hit-or-miss epidemiological patterns led the Yale researchers to believe that Lyme arthritis might be caused by a virus transmitted by insects or arthropods. Ticks, mosquitoes and black flies are under suspicion.

Infectious forms of arthritis are not new. Over the last three years mosquitoes have been shown to transfer several different kinds of arthritis. Among them are the chikungunya and o'nyong'nyong arthritides in Africa. A kind of arthritis called Reiter's syndrome often follows an attack of dysentery.

But according to Steere, Lyme arthritis does not follow the usual form. It looks and acts as though an infection is involved, but so far, laboratory tests have ruled out all agents known to cause arthritis symptoms, and other infectious agents. Communal sources of infection such as food, drinking water and shared swimming places have also been ruled out.

Lyme arthritis may be the first form of the disease in America to be transmitted by an insect. Malawista sees the symptoms of the enigmatic disease as giving researchers "the opportunity of seeing in the laboratory, arthritis, which we think is caused by an infection, from the very beginning. That rash might be the tip-off for exactly when this thing is occurring. The general value," he says, "is getting to see the patients at the onset of the disease . . . that's the time when we'll be most likely to find the agent."

Contributing to the efforts of those trying to define Lyme arthritis are Yale entomologists. Conducting a formal taxonomic study of insects prevalent in the areas affected will enable them to formulate an extract from the ground-up insects. This

sludge will be added to tissue cultures, and if any viruses or suspicious organisms grow out of that, they will test the sera of persons who had Lyme arthritis and who would presumably have antibodies. If the sera of infected persons respond, the infectious agent can then be isolated.

Malawista stresses that the Yale group's first responsibility is to the patients. Although the evidence is still inconclusive, "the fact that we haven't gotten it yet doesn't discourage us," says Malawista. Hoping to identify the disease beyond a doubt, they say they will continue to seek ways of isolating the agent until all of their questions have answers. □

New compound for male contraception

The discovery of potent antispermogenic activity from a group of synthesized drugs marks the latest thrust in efforts to find an effective male contraceptive. Although the female has long been the focus of most contraceptive development research, a decade ago scientists began directing their studies toward her masculine counterpart (SN: 11/4/67). A major part of the argument for this redirection of efforts is that the male systems for producing the sex hormones and sperm cells are essentially separate. This means that a drug inhibiting a man's ability to produce sperm needn't also affect his libido or masculine traits.

Research in the field has produced numerous schemes for repressing the intended mission of the male sperm, and they are generally results of two distinct philosophies of approach. On the one hand there are scientists seeking to prevent the sperm's penetration into the egg (SN: 2/24/73, p. 124), and then there are those trying to disable the production of sperm altogether. It is with the latter intent that the recent discovery reported in the June issue of the JOURNAL OF MEDICINAL CHEMISTRY was made.

G. Corsi, G. Palazzo, C. Germani, P.S. Barcellona and B. Silvestrini from the F. Angelini Research Institute in Rome studied the effects of numerous 1H-indazole-3-carboxylic acids and their derivatives on male rats. Some of the compounds interfered with sperm production by mutilating and destroying the spermatocytes and spermatids, immediate precursors to the actual semen. Furthermore, the activity occurs without apparent damage to the sperm-transporting tissues.

The authors claim that a significant advantage to these compounds is their relatively high potency and selectivity. While previously discovered agents often require large and repeated doses to work and still others are indiscriminate in their effect, the recently found chemicals initiate their specific effect after a single dose. They report that even with the largest doses administered to the rats, toxic effects re-

mained minimal.

"There have been many other compounds which looked all right in the rat," but which later proved ineffective or worse in the human, says Gabriel Bialy, chief of the contraceptive development branch of the National Institutes of Health. Although he cautions that many past ideas which "excited the research community" have since been discarded, "I wish that what they say [for rats] turns out to be true."

Among the questions left unanswered by this study is whether the drugs' effects are permanent. Many encouraging ideas of the past suffer in this one crucial respect. Some methods that induce infertility by applying heat in the form of microwave, infrared and ultrasound radiation directly to the testes (SN: 5/11/74, p. 309) produce effects lasting up to seven years. Over 2.5 million men, however, have acquiesced to one of the most permanent forms of contraception, a vasectomy.

Since no antispermogenic activity has ever been observed in this chemical class before, the scientists claim that in addition to the possible social applications, "a completely new field of chemical research has been opened." □

TM: Understanding the rest of it

Stress has become a common word and a common worry in recent years because of its association with heart disease, ulcers and psychological problems. TM (transcendental meditation) has become a common practice for almost one million people in the United States because, among other things, it seems to relieve stress. But early this year, researchers reported that the beneficial effects of TM might be the result of sleep during meditation, rather than meditation itself (SN: 1/24/76, p. 54). Now it is reported that rest (being seated quietly with the eyes closed) may be responsible for the physiological changes that accompany TM. This conclusion is based on measurements of catecholamines, body chemicals associated with stress.

Trained meditators (most of whom were qualified TM teachers) were compared with control subjects unfamiliar with the techniques of TM. Blood samples were taken before, during and after meditation periods, which lasted from 20 to 30 minutes. Control subjects went through the same procedure, except they sat quietly with their eyes closed instead of meditating. R. R. Michaels, M. J. Huber and D. S. McCann of the Wayne County General Hospital and the University of Michigan report in the June 18 SCIENCE that "essentially the same results were obtained for the two groups." The small changes noted in catecholamine levels could,