age x-ray. Frequently it has been given preoperatively, but most often postoperatively. Latterly, with the increased amounts of radium at hand, that element has been used with increasing success.

The most recent publication in this country is by Lee,[1] who gives his impressions gained from an analysis of 355 cases observed over five years at the Memorial Hospital.

Lee, in tables presented on primary operable breast cases, gave the following figures:

(*a*) Preoperative radiation plus surgery plus postoperative radiation: forty-one cases, or 39 per cent, showing five-year cures.

(*b*) Surgery plus postoperative radiation: seventy-six patients, or 35 per cent, showing five-year cures.

(c) Radiation alone: forty-five patients, or 36 per cent, showing five-year cures.

When Lee compares surgery alone, with surgery plus postoperative radiation, 35 per cent are well at five years with the combined treatment, while only 15 per cent are well with surgery alone, which he admits is lower than other surgical clinics report. In discussing radiation Lee feels very definitely that preoperative radiation is of great value. This is at variance with the opinion of many men who condemn it on theoretical grounds because it may make the operation more difficult and that it may interfere with healing. These are valid objections, but Lee overcomes them by letting a period of at least three or four weeks elapse after the last treatment before operation is undertaken. What the form of radiation is, whether x-ray or radium, Lee thinks does not matter so much, but he holds that radium in the form of a pack is more efficient than the x-ray.

Webster,[2] an English observer, recently presented his experience along similar lines and showed the definite value of radiation with surgery. Even Handley, who is one of the outstanding advocates of surgery, resorts to radiation. Besides the complete excision of the breast, he inserts a tube of radium, highly filtered, into each parasternal space to prevent mediastinal involvement, and at the end of four weeks, x-ray treatment is given. Under this regimen he has 85 per cent of his cases free from any evidence of the disease at the end of three years.

Keynes,[3] an English surgeon who is working with radium loaned by the government through the medical research council, has been using radium element in the form of needles. These are plunged around the breast and into the gland-bearing areas, where they are left as long as a week. From the short experience he has had he is of the opinion that the results compare favorably to those obtained by surgery.

It will take additional observation and time before agreement on the correct technique of radiologic treatment in breast carcinoma is reached, but the fact that radium therapy alone compares favorably to surgery in early cases, and that radiation with surgery gives better results than surgery alone, is indicative of what can be attained in the treatment of carcinoma in well-controlled institutions. At the recent International Conference on Cancer in London, Handley[4] stated that radium alone could destroy malignancy, but inasmuch as there was always the element of uncertainty in the extent of its action, he felt that surgery and radium should be used together in the same case to insure the patient the benefits of both methods of attack.

Saltzstein,[5] reviewing the carcinoma question in Detroit, gave the impression that radiation in conjunction with surgery in carcinoma of the breast is, at best, of doubtful value. Be this as it may, a careful perusal of his article seems to show that whatever surgery was done on breasts in that community was not always done according to the radical procedure. In other words, some of the surgeons were only doing partial excisions, leaving the unfinished work to the radiologist. Such a method is very apt to lead to poor results since the growing edge of the malignant process is too often incised in the incomplete operation, with the result that early recurrence and metastasis take place, bringing discredit to both surgery and to radiation therapy.

These recent articles are of interest since only one of the papers was written by a radiologist. In other words, it represents the opinion of surgeons who have been impressed by the results of radiation therapy as seen in institutions where a careful follow-up permits an unbiased opinion.

ORVILLE N. MELAND, Los Angeles.

REFERENCES

1. Lee: The Therapeutic Value of Irradiation in the Treatment of Mammary Carcinoma, Amer. Surg., July, 1928.

2. Webster: Radiology and Surgery in Carcinoma of Breast, Lancet, July 14, 1928.

3. Keynes: Radium Therapy in Primary Carcinoma of the Breast, Lancet, July 21, 1928.

4. Handley: Report on International Conference on Cancer, Lancet, July 14, 21, 1928.

5. Saltzstein: The Average Treatment of Cancer, J. A. M. A., August 18, 1928.

Syphilology

Bismarsen—An Addition in the Therapy of Syphilis.—Within the last year the new drug bismarsen has won for itself a place among the syphilologists' instruments of warfare. Clinically it is a compound of bismuth and arsphenamin, bismuth arsphenamin sulphonate. It is a yellowish powder, and is quickly soluble in water. Its toxicity is low—white rats tolerate 500 mg. per kilogram of body weight and its chemotherapeutic index is high, as the dose necessary to destroy the spirochetes in an initial lesion is only from 5 to 10 mg. per kilogram of weight. Roentgen-ray studies show that it is absorbed from the muscles two hours after injection. It will cure syphilis in the experimental animal as judged by the standards of observation, serology and negative lymph node transfer.

It has been used on a large number of patients, and the results would seem to indicate that it ranks almost equal to the older arsphenamins. An

important point is ease of administration, it being given intramuscularly. When dissolved in distilled water to which 2 per cent butyn has been added, it is well tolerated by the patients. The injections produce about the same amount of pain and tenderness as do the ordinary bismuth injections.

There are fewer indurations seen after its use, probably because it is given in an aqueous vehicle rather than in an oily one. A course consists of about twenty injections of .2 gram each given twice a week. Patients with seronegative primary syphilis treated with this drug have almost uniformly remained symptomatically and serologically negative.

Patients with late primary and secondary syphilis have become Wassermann-negative after about fourteen injections and have suffered very few serologic, cutaneous or mucous tissue relapses. Perhaps one of the most striking facts in these early cases is the very low incidence of positive spinal fluid findings found after treatment. In this respect bismarsen excelled arsphenamin treatment. Healing of the primary and secondary lesions has been somewhat slower than when arsphenamin is used—the spirochetes disappear from the chancres in about thirty-six to seventy-two hours. Bismarsen has reduced to negativity some cases which had remained "Wassermann-fast" after the usual methods of treatment. It is safe and valuable in cardiovascular syphilis. Here it has given marked symptomatic relief although the serologic results have not been striking. The results in neurosyphilis have not been any better than those from the use of the other arsphenamins.

Very few untoward effects have been noted. The few nitritoid reactions seen after its use have been mild. The skin tolerates it nicely. One instance of exfoliative dermatitis has been reported. It should be used only with caution where there is a history of previous dermatitis from arsphenamin. The gums, gastro-intestinal tract and kidneys bear its administration well.

Time alone can be the judge of the value of any new drug, but evidence so far points toward bismarsen being very worthy of a place among our antisyphilitic agents.

H. J. TEMPLETON, Oakland.

Immunology

Nontoxic Therapeutic Vaccines.—The most serious objection to the vaccine therapy of acute infectious diseases is the danger of increasing the already existing toxemia. The discovery of Ramon that certain bacteria can be detoxicated by formaldehyd without destroying their antigenic properties is, therefore, of clinical significance.

Wherry [1] and his coworkers of the department of bacteriology and preventive medicine, University of Cincinnati, have recently tested the value of such detoxicated vaccines in the treatment of typhoid fever. From their preliminary data it appears: (1) that the course of typhoid fever is shortened by such vaccines; (2) that the incidence of complications is decreased (7 per cent with the vaccine, as compared with 36 per cent in their untreated controls); and (3) that the death rate is decreased. They report no deaths in twenty-eight cases thus far treated with the vaccine, as compared with a death rate of 10 per cent in their untreated controls.

The authors ask for help in collecting additional data before drawing a final conclusion. The technique for the preparation of the nontoxic vaccine is given in their paper.

W. H. MANWARING, Stanford University.

REFERENCE

1. Wherry, W. B., Le Blanc, T. J., Forhay, L., and Thomas, R.: The Treatment of Typhoid Fever with Detoxicated Vaccine, Jour. Infect. Dis., 1928, Vol. xliii, p. 189.

University of California Man Studies Sex Among Insects.—Calling attention to the importance of the amount of food received by organisms during the early stages of life, Professor W. B. Herms, parasitologist and entomologist at the University of California, has just demonstrated that the ratio of male to female among certain insects can be varied at will by the amount of food given them during the larvae state.

He found that by limiting the feeding period of larvae of the green bottle fly he could raise almost twice as many males as females, while with a plentitude of food he obtained about two or three times as many females as males.

He found that one species of mosquito reacted just the opposite of this. By feeding the larvae of the mosquito a limited amount of yeast he obtained about one-half as many males as females, while by feeding four times as much yeast he obtained more males than females.

The food, he explains, does not alter the sex characteristics of the larvae; it merely determines which sex shall predominate among the grown insects of the experimental lot by allowing the weaker sex to die. That is, among the bottle flies, the male larvae can exist on less food than the female, consequently more of them live to maturity. Among the mosquitoes just the opposite holds, the females subsisting on a limited diet more successfully than the males.

In addition to this effect on sex, Professor Herms found, also, that the amount of food given the larvae had an important effect on the size of the later developing adult insect. In the case of the bottle flies he found that those which received a very limited amount of food developed shorter wings than the others. But, contrary to what might be supposed, the longest wings were not found on those which had received as much food as they would take. The greatest average wing length occurred in the group which had merely a moderate supply of food during the larval stage. The same fact was observed with regard to the mosquitoes, though to a smaller degree.

Professor Herms obtained his variation in food supply by the following method. In the case of the green bottle flies (*Lucilia sericata*) a batch of larvae was allowed to feed on beef lung. After thirty hours of feeding, he began removing them, one hundred at a time, at six-hour intervals; allowing them to continue development in a bed of sand. As a result of this some of the flies had only thirty hours of feeding, and some as much as ninety-six hours. In the case of the mosquitoes (*Theobaldia incidens*), larvae of the mosquitoes were placed in jars of distilled water, seventy-five or one hundred to a jar. To these yeast was fed in varied amounts, from one gram to five grams for each jar.—*U. C. Clip Sheet.*