enabled us to arrest the growth and even to cure animals of transplanted tumors."

The following points being definitely established by various investigators, a more complete incorporation of cancer material into a vaccine seemed justified as an experiment:

First: The second inoculation of tumors in mice in which the first plant had grown, had a distinct destructive effect upon the first plant, and in turn disappeared itself.

Second: Cancer is not transferable in animals however susceptible they may be, if the inoculated material is kept for some time outside the body even if kept at body temperature. The danger therefore of reproducing cancer is very small and no instance is reported among surgeons where cancer has followed injury of the surgeon's hands by cancer-contaminated instruments.

Third: There had been noted by a good many observers the definite influence on cancer tissue where extracts and emulsions of other cancers had been injected into the patient with cancer.

Gilman and Coca, recognizing all these facts and the hitherto experimental work on human cases, determined therefore in a series of inoperable carcinomas, to try the effect of an emulsion of the whole tumor, thus including in their therapeutic agent all that could possibly be included in the various extracts which had been tried by others, as well as any virtue that might lie in the body of the cell itself. Their initial report may be found in the Philippine Journal of Science, January, 1910. It gives some encouraging results in the relief of pain and cachexia and shows that in some cases where parts of the inoperable tumor were removed after treatment, that some degenerative changes had taken place.

Discussion.—H. A. L. Ryfkogel: Dr. Brown has gone over the subject so thoroughly that there seems to be nothing to add, except that he failed to mention some experiments of Blumenthal. I have seen in one of the recent numbers of the Medizinsche Klinische Wochenschrift a report on some of the experimental work performed by Blumenthal on some implantation tumors of rats. In 1904 he also published an article of similar work on carcinoma of rats, in which the disappearance of the carcinoma was caused by means of heteralogous vaccine. A rat with a rectal carcinoma was injected with an emulsion made from a carcinoma of another rat, the result being a cure. More recently he has made some studies on sarcoma of the rat, and found that it would disappear when treated by vaccine, and he also was able to treat it by a thoroughly autolyzed vaccine, and in this way claimed to have entirely destroyed the possibility of producing new inoculation tumors such as occurred in some of the cases treated by Gilman's method. He found that autolyzed vaccine was of no use after 21 days; that after 8 days it was not as active as it had been immediately after its preparation. His method of preparing the vaccine consists of grinding up the tissue as Dr. Gilman does, then shaking it thoroughly with several times its volume of chloroform water and incubating it for 72 hours. He found that in the animals upon which this autolyzed vaccine was used, that in no case did it produce inoculation tumors, although the original tumor injected did produce tumors. He found that if this autolyzed vaccine was injected into animals in which the same growth had been thoroughly established, that the tumor rapidly softened and disappeared. He tried no human cases with this method.

THE STATUS OF OUR VACCINE WORK IN CANCER.

By P. K. GILMAN, M. D.

Following experimental work, more particularly that of Van Dungern with whom one of us, Dr. Coca, worked for some months, we determined to apply to the human the methods of "vaccine" treatment in carcinoma that has been tried with various results on lower animals.

In an attempt to secure a "vaccine" against a malignant growth, we used various methods of preparation; extracts of tumors, infusions, and differently prepared comminuted malignant tissue. We decided finally that a "vaccine" prepared as follows gave the best results:

"About 15 to 20 grams of carcinomatous tissue is divided as fully as possible with a sharp pair of sterile scissors, then run through a vaccine grinder which gives a pulpy material of even consistence. The addition of a ccm of glycerin before passing the material through the grinder greatly facilitates the passage through the machine. The resulting pulp is shaken up in 20 cc of sterile saline solution and centrifugated for a few moments at a low speed to throw down coarse connective tissue fibres. The supernatant fluid is decanted with the ground carcinoma cells, enough 5% carbolic acid is added to produce a 0.5% solution, and after standing 4 to 6 hours the dose of vaccine is ready to inject."

Injection of the entire amount is made into the subcutaneous tissue; we have used the tissue of the abdominal wall, care being taken to so distribute the fluid as to avoid tension.

The extra malignant tissue we have stored until needed, keeping it sterile in a solidly frozen condition. Some tumors have been kept for 6 months before being used to prepare a "vaccine."

In a series of cases in Manila we have administered such a "vaccine," the cases embracing practically all stages of carcinomatous disease, from early operable cases through possibly operable to absolutely inoperable cases in the last stages.

The injection of the "vaccine" is followed in the majority of the cases by a local, as well as a general reaction. Locally there occurs about the point of injection a painful swelling; the skin is from 24 to 48 hours becoming quite firmly indurated and tender. If there is not too great tension or if there are present no micro-organisms, the swelling lessens in another 24 hours, and gradually subsides, losing its angry appearance and tenderness. Complete absorption may be slow, a more or less firm nodule persisting for several days. This, however, has always finally disappeared, leaving no palpable residue. Some of the masses have progressed to suppuration, the product of the breaking down, however, being sterile, and probably the result of too great tension at the time of inoculation. In but one or two cases have micro-organisms been obtained from the contents of such an "abscess."

The general reaction which has occurred in fewer of the cases, and upon which we do not at present lay great emphasis, consists in a rise in temperature of from 2 to 4 degrees, a general feeling of unrest and malaise, headache and at times slight chilly feelings. These symptoms usually come on about the second day, and subside the day following.

In each case in our series has an operation been done, and it has been just as thorough an operation as the condition of the disease allowed and the condition of the patient permitted. In those patients of the series where a prognosis was favorable, and the disease apparently eradicated, time only will show the result.

In a second group also when an operative cure was possible, though not probable the same test must be waited for.

In the cases which were inoperable, where definite carcinomatous material was necessarily unremoved at operation, the results of repeated injections of "vaccine" at intervals of two weeks have been instructive.

In brief, cachexia is in practically every case cleared up in a great degree following the injection of "vaccine" in three to five days. The mental condition of the patient is improved, the pain—if present—is lessened, the patient has a better appetite, the color of the mucous membranes improves. This change is marked in a very large majority of the cases and only in those patients who cannot "react," being too far gone, has it failed to follow the use of "vaccine."

About the seventh or eighth day following the injection, a change is noted in the carcinoma tissue

remaining in the body. Its character changes from a previously firm mass to a much softer tissue, some cases progressing to a complete breaking down of nodules, 3.5 cen. in size and the area requiring evacuation of the broken down detritus of cellular materials free from micro-organisms. Where masses of cancer have been large, a marked increase in local temperature has been noted both in the cancer itself and in the body tissues immediately surrounding the growth showing active circulatory changes.

In three cases of inoperable carcinoma of the cervix, in two of the bucal mucosa, one of the parotid, two of the cervical glands, and two of the breast, where undoubted cancer was left in the patient, nodules from one to four cm. in size have softened and disappeared, and in other cases—two of the neck,—have masses retrograded sufficiently in size to allow of a more complete removal by the knife than would have been possible otherwise.

The best results have been obtained with several injections at intervals of two weeks. How many injections to give we do not at present know.

Dr. Coca and I left Manila last March and July respectively, and at the time of my leaving but three of the above class of cases had recurred sufficiently to be noted and produce symptoms, all of the series being then one year old—since operation. How long this favorable state will last it is of course impossible to state, but from our work, of which this is a very brief and hurried scanning, we believe the following conclusions are of interest and importance:

First. Large amounts of carcinoma tissue, if carefully prepared and freely comminuted, may be safely introduced into the human system with no unfavorable results.

Second. Such injections produce an unfavorable effect on carcinomatous growths, causing retrograde changes that may be demonstrated under the microscope and consisting in a granular degeneration of the cancer cells, an infiltration of round cells and macrophage type of cells, and an excessive growth of connective tissue extending into the degenerating tumor.

Third. Cachexia is cleared up to varying degrees.

Dr. Coca, to whom all credit is due in this work, is at present at work on the problem in Dr. Beebe's laboratory* in New York. Lately at Dr. Beebe's suggestion we have preserved the tissue in a ground state by desiccating it over acid and spreading it out on glass plates for future use.

A cure of cancer is not claimed by us. We do claim the results noted in the conclusions and trust the work may lead in some way to the ultimate means of a cure.

* Laboratory of Experimental Therapeutics, Cornell University.

Meeting of December 20, 1910.
A Brief Consideration of the Operative Treatment of Hyperthyroidism.

By WALLACE I. TERRY, M. D., San Francisco.

The term hyperthyroidism is here used as expressing more of the pathology of the condition under consideration and as being less objectionable than the other terms, exophthalmic goiter, Graves', Basedow's or Parry's disease.

The signs and symptoms which particularly distinguish the disease are: goiter, exophthalmos, tachycardia, nervousness, tremors, vasomotor disturbances and changes in the blood. Some of these symptoms may be absent, but as a rule the diagnosis offers but little difficulty. One should not hastily conclude that goiter is absent because the thyroid is not apparently enlarged—a process of the gland may be concealed behind the clavicle or sternum or lie deeply in behind the muscles of the neck. That the disease is primarily due to the thyroid gland seems to be so well established, particularly by the results of surgical treatment and organotherapy, as to admit of no dispute. There are, however, those who believe in other causes, such as Federn's theory of increased blood pressure due to absorption of poison from the atonic bowel and the older theory of nervous origin of the disease.

It was long ago demonstrated that the removal of sufficient thyroid tissue led to the cure of hyperthyroidism, but it was not until the technic of thyroidectomy had been perfected by European surgeons, and particularly by Kocher, that these cases were considered surgical. In the United States previous to 1902 but few operations for hyperthyroidism were reported; since that time the number has increased rapidly, so that more than a thousand are on record. There are several districts in this country where goiter is endemic, particularly along the Great Lakes, and in California there are a few small goitrous districts, as was pointed out by Moffitt in 1905. Cases of hyperthyroidism are found in these districts, but in my limited experience the proportion of Basedow cases to the simple goiters is greater in California than in the territory near the Great Lakes.

The pathology of the thyroid in cases of hyperthyroidism is of interest particularly as related to therapy. The researches of McCallum and others have established that there is a marked increase of the active epithelium lining the acini—the acini may be increased in number, they may be packed with epithelium or they may contain papillomatous ingrowths of epithelium. Marine has shown that in dogs active hyperplasia of the thyroid often undergoes a change to a colloid condition, either spontaneously or under the influence of iodin. He considers this process of reversion physiological and not pathological, and furthermore that the colloid goiter is the nearest approach to normal in its iodin content which is reached by a hyperplastic gland.

Indications for surgical treatment of hyperthyroidism: After rational medical treatment for a brief time without marked benefit, these cases are properly surgical—by a brief time is meant not more than three or four weeks. Some cases have been cured by rest alone, others are favorably influenced by rest plus such drugs as bromides, digitalis, strophanthus and iodides. In view of the work of Marine, it seems probable that iodin simply brings about a colloid change in a gland with active hyperplasia, and thus reduces the amount of toxic substance which is elaborated by the epithelium. Organotherapy has been of use in some cases, and Rogers and Beebe report a number of cures with their serum, although other observers have not met with the same success. The point I particularly wish to emphasize, however, is that medical treatment should not be continued unless the patient is rapidly improving, for the damage to the heart and the nervous system from hyperthyroidism is often irrepable. Despite the fact, though, that late or neglected cases are bad surgical risks, I do not think the surgeon should refuse to operate on them after proper preparation, for many can be saved from an almost inevitable fatal result. One distinguished surgeon in this country is quoted as refusing to operate on cases showing edema, irregular heart action and albuminuria with casts. If it be with the idea of presenting good operative statistics, then it is wrong. In my series of cases I have had five extremely severe ones and all have been immensely benefited—indeed I do not hesitate to say their lives have been saved by operation.

Preparation for operation: In the majority of cases, rest in bed with an ice bag over the heart and moderate doses of brimides are of value in putting patients suffering from hyperthyroidism in better condition for operation. The psychic element in these cases should also be studied and the surgeon should endeavor to put himself en rapport with the patient. The method of Crile of daily inhalations of essential oils and later the administration of ether and the so-called "stealing of the goiter" has some advantages and has been employed by me in two cases with success, but deception of this sort will soon be known to the laity and the method will lose its value.

Ligation of one or more thyroid arteries is a very valuable preparatory measure in the severer grades of hyperthyroidism. It is ordinarily a simple oper-