glands as a routine method in operations for cancer of the breast, and it should be noted that Butlin, who in other respects followed Halsted's method closely, did not remove the supraclavicular glands in any of his cases, and believes with Cheyne that when these glands are removed, the case is hopeless. The statistics of Banks, Cheyne, and Butlin, which equal those of Halsted, would go to show that as good results can be obtained without this step. Until further evidence is forthcoming, I believe we are justified in not removing the supraclavicular glands, unless glands are discovered very high up. Inasmuch as removal of the pectoral muscles does not greatly interfere with the usefulness of the arm and does facilitate the dissection of the axillary contents, it is perhaps better to remove at least a portion of the greater pectoral muscle along with the breast.

In order to obtain better results, I think it is far more important to remove wider areas of skin and more of the adjacent fat, for we find that recurrences take place in the skin or fat a dozen times to one in the pectoral muscles.

The recent statistics of 100 cases of the Presbyterian Hospital of New York published in *The Medical News*, April 28th, 1900, by MacWilliams, still further support this view. His cases were operated on during the years 1889–99. In 48.9 per cent. of them the lymphatic glands were palpably enlarged. Yet of 75 cases which were examined microscopically after removal, 78.6 showed cancerous infection. The mortality of operation was 4 per cent.; and of 66 cases traced, 34 per cent. were well for a period of from 3 to 10 years. MacWilliams states that all the recurrences except 2 died within 2 years.

Here again we see the danger of generalizing from a single series of a small number of cases, especially as in 26 cases the after-histories were not traced. It is a significant fact that more than twice as many recurrences took place in the skin and scar than in any other locality. Of 34 recurrences 15 took place in scars and 6 in the lung; 3 in the opposite breast, and only 2 in the supraclavicular glands.

Halsted's brilliant "Results of Operation for Breast Cancer at the Johns Hopkins Hospital from June, 1889, to April, 1898,"* are of great interest and value. In all 133 cases were operated upon, 76 of these more than 3 years ago. There have been 13 (9 per cent.) local and 22 (16 per cent.) regionary recurrences. Of the 76 cases operated upon 3 or more years ago, 31 (41 per cent.) are living without local recurrence or signs of metastases; 10 died more than 3 years after operation, and 1 as late as 5.5 years after. Of these 10, 1 had a local recurrence. Forty cases, therefore (52 per cent.), lived more than 3 years without signs of local or regionary recurrences. Some of the 10 cases which died may have had, at 3 years, signs of metastases. Thirty-five (46 per cent.) died within 3 years of the operation, and 7 of these were local recurrences.

Dr. J. Collins Warren, in his valuable paper on "Curability of Cancer of the Breast," gives results of 72 cases operated upon during the past 15 years. Of these 38 died of recurrence of the disease, 26 are alive and well, 2 died of other diseases, and the remainder were not traced. Out of 50 cases in which recurrence was noted, in 34 the disease returned locally, either in the skin or subcutaneous fat, showing, as I have pointed out in most of the other statistics, that the present methods of operation fail to remove a sufficiently wide area of skin. In only 1 case did the recurrence take place in the supraclavicular region. Seventeen cases have remained well beyond 3 years, giving a percentage of 30.9 per cent. During the period of 1883–95, 22 cases were operated upon by more elaborate methods than the preceding cases; of these 36.3 per cent. passed the 3-year limit without recurrence; in all of the cases, however, the axillary glands were carefully removed. Warren states, with truth I believe, that the present experience with the new operations hardly justifies one as yet in deciding upon the limits of the curable cases. Until these limits are more strictly defined, it is probable that many incurable cases will be subjected to operation. He adds that it is his hope that wider experience will spare many a patient the ordeal of a useless operation.

With regard to glandular involvement, the glands were felt in the axilla in 54 cases; in 5 cases supraclavicular glands were noted; 3 of these died: 1 was alive, at time of writing, and 1 was not traced.

Warren's statistics emphasize some very important facts as to the duration of the tumor prior to the operative interference; the average period in 68 cases was 10.1 months. In 16 cures the average was 11.6 months, while in 38 failures it was 9.4 months. At first it seemed somewhat strange that the successful cases were operated upon later than the failures. Warren's explanation is probably correct, that the longer time during which the tumor had existed in the successful cases prior to operation simply shows the milder type of the disease. A person with a rapidly growing and consequently more malignant type of tumor is far more likely to be disturbed and to seek early surgical or medical advice than one with a more slowly and hence less malignant disease.

Cancer of the Lip.—Sarcoma of the lip is exceedingly rare, so rare that it is seldom mentioned by writers on cancer. I have personally observed one case of small, round-celled sarcoma of the lower lip in a little girl aged five years. The disease was twice removed, but recurred rapidly after each operation. It disappeared under the injections of the mixed toxins of erysipelas and bacillus prodigiosus, and is now well more than three years after operation. Cancer of the lower lip is almost always of the type of squamous-celled carcinoma, and rarely occurs in subjects under the age of forty years. The usual history is that of a slight irritation near the junction of the mucous membrane and the skin, resembling a small wart, which is irritated by the patient's picking and rubbing it. It frequently heals over, but in a short time the scab comes off and a small ulcer or fissure remains. It may continue for years with very slight increase in size. The duration of the disease is very variable, ranging between a few months and fifteen to twenty years. Death almost always occurs by exhaustion and seldom from metastases. The submental, submaxillary, and, finally, the cervical glands are likely to become involved in the order mentioned. The glandular involvement may occur early in the disease or it may be delayed for a long period. Simple enlargement of the glands does not always mean that infection has occurred. Butlin cites a case of a patient who died within a few months from the first appearance of the cancer, with extensive ulceration of the lip and secondary infection of a large number of glands. I have personally observed a similar case in a negro, in whom the disease ran such a rapid course that it strikingly resembled an acute infectious process. Within six weeks from the time the tumor was first noticed, the entire lower lip, floor of the mouth, and portion of the jaw, together with nearly all the glands in the neck, were infected, the latter being enormously enlarged. The patient died within three months from the inception of the disease, without metastases. In those cases in which the progress of the disease is very rapid, there is another point of similarity between cancer and acute infection, namely, a marked rise in pulse and temperature.

Method of Operation.—The only method that needs to be seriously considered is free removal with the knife or scissors, of a V-shaped portion of the lip containing the tumor and a wide margin of healthy tissue, from one-half to three-fourths of an inch beyond the border of the disease. In cases requiring removal of a large portion of the lip, the method of Malgaigne, or some one of the numerous modifications of the method, should be employed. The glands should always be removed when enlarged, and I believe that it is better to remove the submental and submaxillary glands as a routine measure in all cases, except in those in which the disease is of very short duration. The deformity caused by the removal of cancer of the lip is very slight when the tumor is small, and when it is large, almost the whole lower lip may be removed without causing great deformity, so long as the plastic operation is carefully and skilfully done.

Results of Operation.—The mortality of operation at the present time is very slight. In 896 cases collected by Wörner* there were 62 deaths, or a mortality of 7 per cent. Fricke's more recent statistics of the Göttingen Clinic, covering the years between 1874 and 1896, show 8 deaths in 114 cases, or the same mortality as that reported by Wörner. Five out of the 8 cases collected by Fricke, however, were complicated by removal of a portion of the lower jaw. The question of the necessity of removal of the glands in all cases Fricke's paper leaves still in doubt. In 8 of the successful cases they were not removed, although they were decidedly enlarged; yet the patients lived from 3 to 18 years after operation. Butlin states that at present he does not believe that routine operation for removal of the glands in every case of cancer of the lower lip is indicated. In Fricke's list they were removed in 24 out of 33 unsuccessful cases. This, however, does not prove that the patients would have done any better, had they not been removed. It seems wise to remove them in all cases, inasmuch as this procedure is not likely materially to increase the mortality, if at all. In Fricke's series the lower jaw was resected in 10 cases with 5 deaths; and only 1 of these cases was cured by the operation. Curiously enough, this case of cure was one in which the prognosis was exceedingly bad from the start. A second operation was done for extensive recurrence 4.5 months after the first, and yet the patient was well 11 years after.

Loos (*Beiträge z. klin. Chir.*, Bd. XXVII., May, 1900) gives an analysis of 565 cases of cancer of the lip treated at Bruns' Clinic, at Tübingen, 534 of which were of the lower lip and 31 of the upper lip. In three-fourths of the cases the glands were enlarged. The mortality of the operation during the period from 1843 to 1885, was 6.2%; from 1885 to 1898 it was 0.4%. The final results showed 51.6% successful in the earlier period and 66% in the later period. Of the cases operated upon between 1843 and 1884, 1 was well at the end of 45 years, 10 were well at the end of from 22 to 26 years, and 14 were well at the end of from 15 to 19 years.

The final results of operation for cancer of the lip are perhaps equal, or superior, to those in any other locality. The statistics of the cases at the Göttingen Clinic, 114 in number, mostly operated upon by König, show that 53 per cent. remained well more than 3 years after operation. Four hundred and twenty-four cases of cancer of the lower lip, collected by Butlin prior to the statistics of Fricke, show 38 per cent. of cures. After the disease has once recurred, there is very little hope of saving the patient by further operation. In only 3 out of 52 cases reported by Fricke as having passed the 3-year limit had there been a second operation performed. If the jaw is already involved, the prognosis is exceedingly bad. Butlin states that such operations are followed by a high rate of mortality, and are very rarely permanently successful.

Cancer of the Tongue.—Cancer of the tongue, though less frequent than cancer in many other localities, is perhaps the most distressing of all to the patient. The disease usually begins along the free border, either at the extremity of the tongue or on one side. Not infrequently there is a history of irritation from a carious tooth. In the early stages the diagnosis may be difficult. The conditions most likely to simulate cancer of the tongue are: tuberculous, syphilitic, or chronic inflammatory affections. Tuberculosis may so closely resemble cancer that a careful microscopical examination may be necessary to differentiate it. Tuberculosis of the tongue, however, is so rare that it will seldom cause difficulty in diagnosis. I have, however, operated upon one case in which the clinical appearances pointed very strongly to epithelioma, and, in addition, a portion of the tumor removed for examination was pronounced epithelioma by the pathologist of a large hospital. When the anterior portion of the tongue was removed, further and more careful examination showed that the disease was not epithelioma, but tuberculosis. Syphilitic lesions may closely simulate cancer, but in most cases we are able to find other evidence of specific disease, even if the history is denied.

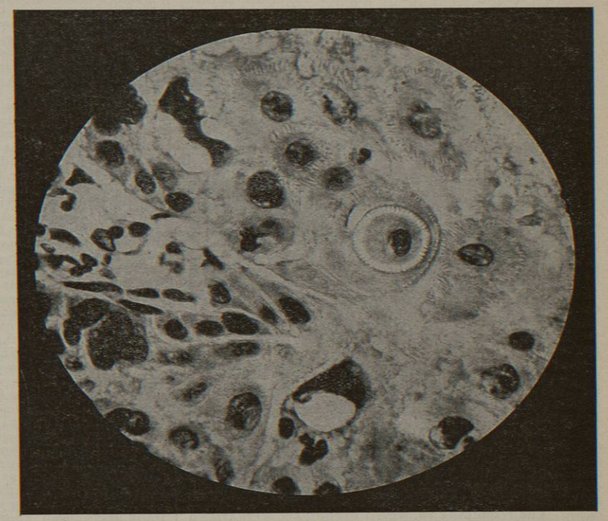

Fig. 1103.—Epithelioma of Cervical Lymph Gland. Secondary to epithelioma of tonsil. (Buxton.)

The treatment consists in removal of the whole or part of the tongue as soon as the diagnosis is made. The choice of operation depends somewhat upon the extent of the involvement. If the muscular portion of the tongue is involved, especially of the posterior region, better results may be obtained by the method known as Kocher's operation. Whitehead's operation, or a slight modification of the same, including preliminary ligature of the lingual arteries and removal of the sublingual and submaxillary glands, will, I believe, prove the best method in the great majority of cases. Its advantages over Kocher's method are very great. The mortality is much

* Transactions Am. Surg. Assn., 1898.

* Beitr. z. klin. Chir., II., 129, 1886.

lower, and the wounds are more likely to heal primarily. Kocher's method is open to the serious objection that, in dragging the tongue out through the floor of the mouth, it is impossible to prevent the tumor, usually in an ulcerated condition, from coming in contact with the freshly cut healthy tissues, thereby running the risk of new infection. Curtis' suggestion of removing that part of the tongue containing the tumor through the mouth and completing the operation by Kocher's method, is objectionable in that it unnecessarily complicates the operation. The results of Whitehead's method are equal, or superior, to those obtained by Kocher's method. The question of how much of the tongue it is necessary to remove is a very important one. Some surgeons advocate removal of the entire tongue, even if the disease is comparatively limited in extent. Butlin does not believe that the entire tongue should be removed in every case. He states that the aim of the operator should be to remove the disease and about three-fourths of an inch of healthy tissue. If the disease is on the border of the tongue, the best practice is to remove that half of the tongue to an inch behind the disease. When it is near the tip or fore part of the dorsum, the fore part of the tongue should be removed. Butlin does not advocate the preliminary ligature of the lingual arteries as a routine measure. In my own cases I have usually tied the linguals prior to removal of the tongue, and this does not really complicate the operation, inasmuch as the glands of the neck may be removed through the same incisions which expose the arteries. Butlin's latest method of dividing the operation into two stages has much to recommend it. Thorough dissection of the anterior triangle of the neck and removal of all the glands is in itself a considerable operation, and if to this is added the removal of the tongue, the mortality is likely to be higher than if the operation were divided into two stages. Butlin now removes the disease of the tongue first, and about three weeks later the anterior triangle is opened and the glands are removed.

Results of Operation.—The latest statistics, comprising 33 cases of Krönlein, 59 of Kocher, 139 of Whitehead, and 102 of Butlin, giving a total of 333 cases, show 42 deaths from operation. Whitehead's personal cases (139 in number) show 20 deaths, or a ratio of 14.3 per cent. In 23 deaths in which the cause was stated, pneumonia and sepsis account for 12. As regards final results, 199 of the 333 mentioned were traced. Of these, 40, or 20 per cent., were well and free from disease or had died from other causes than cancer, upward of 3 years after operation. Butlin's personal statistics show 10 deaths in 102 cases. The remaining 92, with 7 exceptions, were traced to final results. Of these, 20 were well from 3 to 12 years after operation. In 18 cases there was local recurrence, in 28 glandular alone.

Operative treatment is contraindicated if the disease extends far back, or if the glands of the neck are markedly enlarged and fixed, or if the jaw is involved.

Cancer of the Face.—The face is one of the most common sites for cancer, the probable reason being that it is more exposed to various sources of irritation. The most common type of cancer found in the face is rodent ulcer. There is very little difference in the two sexes as regards the frequency of cancer in this locality. Of 200 cases collected by Butlin, 110 occurred in the male, 90 in the female. The mortality of operation is comparatively high. Butlin's statistics of 206 cases of cancer of the face, mostly rodent ulcer, show 21 deaths, of which 9 were due to erysipelas. The more recent statistics show a lower mortality. In 100 cases treated at the St. Bartholomew's Hospital, in 1889–1898, there was only one death.

As regards permanent cure, the prognosis is good if the disease is attacked early. Krönlein's cases show 36 per cent. well beyond 3 years. But in this particulas locality we must bear in mind the fact that late recurrences (namely, at periods considerably beyond 3 years) are by no means infrequent. Glandular involvement is very rare in rodent ulcer of the face, and the disease destroys life by local extension and gradual exhaustion. This form of cancer is perhaps the most distressing and painful of any with which we have to deal; and while it, in most instances, could be cured if attacked very early, when once it has gained a firm foothold it is exceedingly difficult to eradicate. This is the form of cancer in which caustics of various kinds have been most frequently employed. While it is unquestionable that rodent ulcer in the early stages may be cured by caustics, we believe that in the great majority of cases better results will be obtained by the knife. Besides, they are obtained in a shorter time and with less pain and discomfort to the patient. One of the best caustics to be employed for cancer in this locality is the liquid butter, or terchloride, of antimony, applied by means of a glass rod. As regards the value of caustics, Butlin states "there is not the slightest reason why even extensive rodent ulcer of the face should not be treated by caustics with as thorough success as if the knife had been employed." He admits, however, that, as usually employed, they destroy only the surface of the disease, leaving the base behind and, hence, doing more harm than good. To be of any value, they must be used freely and vigorously. Butlin believes that Vienna paste is the best form of caustic. It is applied in a thick layer over the area to be destroyed, including half an inch of apparently healthy integument all around the ulcer.

Cancer of the Stomach.—Malignant disease of the stomach is practically always carcinoma. Sarcoma, though occasionally found, is extremely rare. It may be either the columnar-celled or the squamous-celled variety, the former being by far the most common.

Diagnosis.—The diagnosis in the early stage is difficult, and inasmuch as it is important that it should be made at a very early moment if treatment is to be of much avail, the tendency at present is more and more in the direction of an early exploratory operation. With careful aseptic precautions this exploration is not likely to be attended with appreciable risks.

Hemmeter advises operation: (1) in the presence of dilatation; (2) in the presence of cachexia; (3) in the absence of hydrochloric acid; (4) in cases of excess of lactic acid; (5) in the presence of the Oppler bacillus.

Operative treatment consists in gastrectomy, complete or partial; pylorectomy or gastro-enterostomy. Space will not permit a description of the various operative methods. (See *Stomach, Surgery of the.*)

Results of Treatment.—Up to the present time 7 cases of complete gastrectomy have been reported, with 3 deaths. Seven other cases of nearly complete gastrectomy have been operated upon, with 2 deaths. The mortality of pylorectomy, as estimated by Haberkant* from a study of 257 cases, operated upon between the years 1881 and 1887, is 64.4 per cent. Between 1887 and 1894 it is 42.8 per cent. Goffe† found the mortality to be 76.5 per cent. in English and American cases during 1882 and 1890; 28.6 per cent. between 1890 and 1898. Individual statistics show much better results. For example, Krönlein operated upon 24 cases with 5 deaths, and only 2 deaths occurred in his last 20 cases. As to the duration of life after pylorectomy, Haberkant found that in 51 cases traced, 21 were alive from 1 to 8 years after operation. Nine of these were well for over 3 years. The improvement of later results is attributable to earlier exploratory operations and more extensive excision of the stomach. The high mortality of earlier days was largely due to postponing the operation until the strength of the patient was insufficient to stand the shock.

Cancer of the Intestine.—Cancer may occur in any portion of the intestines from the stomach to the rectum. The relative frequency of its occurrence in the different portions of the intestines is well shown by the statistics of de Bovis:

Cancer of the rectum, 49.2%; colon, 20.4%; sigmoid, 11.9%; small intestine, 6.3%. Sarcoma may occur, but is

* Arch. f. klin. Chir., 1896, Bd. 51, p. 484.
† "Lectures on the Surgery of Diseases of the Stomach," by Barker.

extremely rare. Madelung has collected 14 cases of sarcoma of the small intestine. Carcinoma occurs most frequently between the ages of 40 and 65 years. R. de Bovis (*Revue de Chirurgie*, 1900, Nos. 6 to 12) has given us the most extensive and valuable contribution to our knowledge of cancer of the large intestine yet published. He collected 426 cases of cancer of the large intestine (exclusive of the rectum). Of these, 53.9 per cent. were among males, and 46 per cent. among females. The diagnosis is seldom made until the growth has advanced sufficiently to cause stenosis in the bowel. Furnevall states that crises of paroxysms of colic, or periods of prolonged constipation and diarrhœa, with early weakness and progressive wasting in spite of medical treatment, are important symptoms. In several instances I have noticed that localized distention, due to the accumulation of gas in front of the stricture, is an important sign. This is sometimes observed by the patient himself, and regarded as a lump or tumor. Sometimes by manipulation it disappears with a slight gurgling sound.

Operative Treatment consists in resection of the bowel, making anastomosis, short-circuiting the constriction, or, if the disease is situated lower down toward the rectum, making colostomy. If the disease is in the small intestine, the Murphy button can be employed with advantage. Czerny states that he has given up its use in the colon for the reason that the lumen will become blocked with semi-hardened fæces, and the patient will die of obstruction. R. de Bovis (*loc. cit.*) states that in his series of 426 cases of cancer of large intestine, Murphy's button was employed 14 times with 4 deaths. Of these deaths 3 were attributed to the button. In 1 patient upon whom I personally operated, and in whom I did a double resection of the sigmoid and seven inches of an adherent loop of small intestine which had become involved by contiguity, I employed two Murphy buttons, one for uniting the ends of the small intestine, and the other, a large, oblong button, for making a lateral anastomosis between the closed portion of the ascending colon and the cæcal end of the small intestine. The patient made an uneventful recovery; both buttons passed on the ninth day. The patient remained well for 1 year and then had a slight recurrence in the parietal peritoneum. He is alive and in good general health at present, twenty-one months after the operation. The mortality of resection of the large intestine in 241 cases collected by Lardinnois was 34.8 per cent. Czerny's mortality for resection of the large intestine is 50 per cent.; Woelfler's, 54 per cent. in 114 cases. Wallace reports 12 cases of resection at the St. Thomas Hospital, London, between 1888 and 1897, with 7 deaths, or 58.3 per cent. Of 51 cases collected by Frank between the years 1884 and 1888, only 1 was known to have lived more than 3 years without recurrence. Woelfler, however, has collected 17 cases that were well from 4 to 16 years after operation.

R. de Bovis found the mortality in 101 cases of entero-anastomosis for cancer of the large intestine to be 38.6 per cent. The average duration of life after the operation of entero-anastomosis was 6.4 months, and the total average duration of life from the inception of the disease 21.2 months. Of 171 cases treated by resection the mortality was 31.5 per cent.—de Bovis believes that 38 per cent. is the actual present mortality. Up to 1889 it was 58 per cent. Fifty-one cases operated upon by 22 of the most distinguished continental surgeons since 1889 show 37.2 per cent. mortality. Of de Bovis' series of 171 enterectomies there were only 8 cures.

Cancer of the Rectum.—Cancer of the rectum rarely occurs before the age of 35, and it is seen more frequently in men than in women, the proportion being about 6 to 5. It forms 4 per cent. of all cases of cancer. The symptoms during the early stages of the disease are ill defined, and usually consist more in a feeling of heaviness and discomfort than in one of actual pain. Stools are apt to be scanty and more frequent than usual. Constipation often alternates with diarrhœa. Later on, there is actual pain and occasionally some blood passes with the stools. The rectum should always be examined in suspicious cases. Carcinomatous ulceration shows the characteristic induration with hard, irregular margins, and if the disease is within reach of the finger, which is usually the case, the diagnosis is not often very difficult, except in the very early stage. In addition to digital examination, the speculum should be used in cases in which there is still doubt, and a portion of the suspicious area should be removed and examined microscopically.

Treatment.—The only treatment to be recommended is excision of the rectum in all cases in which it is possible to remove the disease. The choice of methods lies between the sacral or Kraske's operation, and the older perineal method. During recent years Kraske's operation has been adopted by most American as well as continental surgeons for all cases of cancer of the rectum, on the belief that its results were so much more promising as to outweigh the higher mortality. Even Watson Cheyne, one of the best representatives of sound and conservative English surgery, states that while the perineal operation is suitable in some cases, in the majority it is best to employ one or the other of the methods which give good access to the part from behind, such as Kraske's operation or some of its modifications. Comparing the results of the perineal with Kraske's method up to 1896, Cheyne states that the mortality of the perineal method seems to be about 8 per cent.; that of the sacral, 18 or 20 per cent. The results of operative treatment of cancer of the rectum at Küster's Clinic, Marburg, since 1885,* reported by Wendel, throw valuable light upon the comparative value of these different methods. The total number of cases observed was 126. Of 46 cases operated upon by the perineal method, 8 died directly or indirectly from the operation. Of the 38 remaining, 35 were traced. Six of them were well from 3 to 5 years; 3 from 7 to 11 years after operation. Of 46 cases operated upon by Kraske's method, 14, or 30.4 per cent., died of the operation; 26 of the remainder were traced to final results, and 5 were alive from 6 to 11 years after operation. Thus, the mortality of the sacral method was nearly double that of the perineal; and the final results as regards cures were inferior. As Wendel points out, these figures should not be taken as a true indication of the relative value of the methods, as in many of the cases operated upon by the Kraske method the disease was more advanced. The duration of wound healing is much longer in the sacral than in the perineal operation, the average duration being 64 days in the sacral. Wendel concludes that 9.4 per cent. of the cases in which radical operation was performed survived from 6 to 12 years without recurrence. Adding to these the cases that died of other diseases without recurrence, he estimates the number of final cures at 16.8 per cent. Kraske's personal results in 80 cases show a mortality of 18.7 per cent. and 6.2 per cent. of cures. Hochenegg operated upon 89 cases by the sacral method with a mortality of 9 per cent. and 12.49 per cent. of cures. Mikulicz's 57 cases operated upon by Kraske's method show a mortality of 24.56 per cent. and 6.69 per cent. of cures.

These statistics, combined with those of Kraske, show a mortality of 18.7 per cent. and 10 per cent. of cures. They certainly justify the conclusion of Wendel that there is no reason for ignoring the perineal method to the extent that it has generally been done. The plan adopted at Küster's Clinic might well be followed by others. It is, never to decide beforehand what method of operation is to be performed, but always to employ that method which best meets the conditions of the individual case. Whenever the cancer is within easy reach and well defined, the perineal method should be chosen. In cases in which the disease is located high up, or complicated by inflammatory infiltrations of the neighboring tissues, extension of the tumor to the adjacent parts, the sacral method should receive the preference. Wendel believes that in one-half of the cases reported it is possible, or even preferable, to operate after the perineal method.

* Deutsche Zeitschr. f. Chir., January, 1899, Bd. l., Hefte 3, 4.

Heinrich Wolff, in his article on the "Radical Operation for Cancer of the Rectum,"* refers to the apparently contradictory statements as regards results in the statistics of various authors, and says that the same are due to the different views taken by different writers with regard to the indication for operation before and during the interference.

Of 155 cases of cancer of the rectum (101 men, 57 women) admitted to the Clinic between 1888 and 1900 (excluding those of 1900), 125, or 80.6 per cent., were subjected to radical operation. On the other 30 cases no operation at all, or palliative operation, was performed. In 60, or 48 per cent., of the 125 cases of radical operation, amputation of the rectum, and in 65, or 52 per cent., resection of the rectum, was done. The ages of the patients ranged between 20 and 80: 7 between 20 and 30; 14 between 30 and 40; 126 between 40 and 70; 8 between 70 and 80. Of the 60 cases of amputation of the rectum, 9, or 14.7 per cent., died in consequence of the operation. Of the 51 patients on whom the operation was successfully performed, 39 were traced, and of these 12 are still living, 1 with a recurrence more than 3 years after operation. The remaining 11, or 28.2 per cent., of the number traced, are alive and free from recurrence from 3 to 11 years after operation. Of the other 27 who survived the operation, 17 died within the first 2 years; 7 within the third year after operation; 2 lived 3 years 9 months each, and one 5 years. The majority died of recurrence. In most of the cases of amputation of the rectum it was necessary to operate by the sacral method. In 17 instances no bone operation was done (Lisfranc, Kocher); in 21 instances the coccyx was extirpated, and in 8 instances the coccyx and part of the sacrum were resected. The peritoneum was opened in about one-half of the cases.

In the 65 cases of resection of the rectum the peritoneal cavity was opened as a rule, but immediately after the gut had been drawn down the peritoneal cavity was closed by suture. In 2 cases laparotomy was performed (1 death and 1 permanent result). In all of the remaining 63 cases the sacral method was used; 46 times an osteoplastic preliminary operation was done—*i.e.*, 8 times temporary resection of the coccyx; 38 times temporary resection of the sacro-coccyx. Of the 65 cases of resection, 31, or 47.7 per cent., died; of these, 20 in direct consequence of the operation, 11 of complications, such as pneumonia, general cachexia, embolism of lung, etc. Of the 34 who survived the operation, 28 were traced. Of these, 8 are still living, 1 with a recurrence 1 year and 6 months after operation. Of the remaining 7, 1 is well and free from recurrence 1 year and 5 months after operation; 1, 2 years after operation; 2, 3 years; 1, 3 years and 3 months; 1, 7 years and 9 months; and 1, 11 years after operation. Of the other 20, 10 died during the first year; 8 during the second and third years; and 2, 3 years and 9 months and 4 years and 6 months, respectively, after operation. All succumbed to recurrence except the last 2, who died of intercurrent disease. If we include the latter among the permanent cures and exclude the 2 cases that are free from recurrence less than 3 years after operation, we have 7 out of 26, or 26.9 per cent., of permanent cures. The total mortality of all the cases of radical operation (resection and amputation) is 40 out of 125, or 32 per cent. Counting only the deaths directly due to operation (27), we have a mortality of 21.6 per cent. Twenty of the deaths were due to collapse. Not 1 of the 60 cases of amputation, and only a very small number of the 65 cases of resection, died of infection, a circumstance which Wolff ascribes to the "fully open" treatment of the wound and extensive use of iodoform gauze. The total number of permanent cures obtained in the entire series of 125 is 27.5 per cent.

As regards continence, there were 9 cases of absolute continence. In 7 instances the continence was relative. In 1 case it was moderate, and in 1 there was absolute incontinence. On the whole, the patients were able to insure an almost complete continence by exercising a little care in regulating their stool.

Cancer of the Parotid Gland.—Cancer of the parotid gland may be of different types; mixed-celled sarcoma is, however, the most common. The malignancy of these tumors varies within wide limits. Formerly nearly all the growths were regarded by pathologists as carcinoma. Later observers were inclined to class them as sarcoma, while at present the tendency is to group many of them as endothelioma. The classification is extremely complex and difficult. Butlin believes that the only course left open in dealing with the subject from a clinical and operative standpoint, is to consider all malignant growths of the parotid under the common name of "cancer." This certainly seems the most rational course. Some of these tumors of the parotid run an extremely rapid course. I have personally observed one, a round- and spindle-celled sarcoma of the parotid of high vascularity, which developed in a man, aged forty, immediately after a blow from a horse's head. It grew very rapidly and was removed a few weeks later. Recurrence quickly following, a second and a third operation were performed without checking the progress of the disease, which proved fatal in about four months from the date of its origin. I have had under personal observation 12 cases of malignant disease of the parotid; all of these were classed by pathologists as sarcoma, mostly mixed-celled, although some were pure round- and some spindle-celled. Two of these cases that were recurrent and inoperable at the time of first observation, and hopeless, have been apparently cured by the mixed toxins of erysipelas and bacillus prodigiosus, 1 having remained well more than 4 years, and the other upward of 3 years after treatment.

According to Butlin, the prognosis after operative treatment is extremely bad. Three out of 17 patients in his statistics died of operation, and it is not stated that any remained well long enough to be considered cured. Butlin states, with regard to cures, that up to the present time there are very few instances of cures by operation of undoubted malignant disease of the parotid. One probable reason for this is, that up to the present time surgeons have been too anxious to save the facial nerve and, hence, the operations have not been sufficiently extensive to eradicate the disease. If there is to be a reasonable prospect of curing the patient by operation in the future, the facial nerve will undoubtedly have to be sacrificed.

Cancer of the Penis.—Cancer of the penis almost always takes the form of carcinoma, sarcoma being exceedingly rare, only 10 cases having been collected from the literature. Epithelioma is the type of carcinoma most frequently found, and it usually begins at the junction of the prepuce with the gland. The disease seldom occurs before the age of 50 years, and is most frequently seen between 50 and 70.

In making a differential diagnosis, the condition most likely to simulate cancer of the penis is a specific ulcer. The absence of a history of infection or other signs of syphilis will enable us to make the diagnosis. If the lesion is very small and there is doubt as to its character, a small portion may be safely removed under cocaine and submitted to microscopical examination. Secondary infection of the glands in the groin usually occurs, though not, as a rule, until the disease has existed for a considerable time. The average duration of a cancer of the penis without operative treatment is about 3 years.

As to methods of operation, partial or complete amputation of the penis is usually indicated. Although the cautery has been advised by some, the knife is to be preferred. The inguinal glands should in all cases be removed, whether they can be felt or not. If the operation is performed under the best aseptic conditions, the mortality is comparatively low. The risks of death from hemorrhage are very slight. The vessels should be tied as they are cut, and the oozing from the corpus cavernosum may be checked by pressure from iodoform gauze. The mortality as estimated by Butlin is 6 per cent. in the simple operation, but considerably greater in the cases

* Arch. f. klin. Chir., lxii., 1.

in which complete extirpation of the penis, together with the inguinal glands, has been performed.

As regards the final cures, Butlin reports 65 cases that were traced for 3 years, in addition to 16 others that were alive and free from recurrence for periods ranging from a few months to from 2 to 3 years. Of the 65 patients 23 were well beyond 3 years, giving a proportion of successful cases of upward of 35 per cent. Butlin states that in almost all the successful cases the operation consisted in simple amputation of the penis and not extirpation, the disease having been at or near the extremity. The number of cases in which the inguinal glands were removed is not known.

H. Küttner, in his article entitled "Carcinoma of the Penis and Its Dissemination through the Lymph Passages,"* furnishes some very valuable data based on a series of 60 cases observed at the Tübingen (Bruns') Clinic. He states that while for the local extension of the disease the vascular system is of greatest importance, it is of little or no account as regards metastatic spread, internal metastases being of rare occurrence; in addition to 1 of his own cases reported, he has been able to find but 9 such cases in the literature. He has made some extensive anatomical studies, and gives his conclusions, which are very important.

As regards the prognosis of carcinoma of the penis, Küttner states that there is hardly a carcinoma which offers such favorable conditions for a permanent cure as this. This is partially due to the fact that in a large percentage of the cases the disease remains local for a long time and shows little tendency to invade the regionary lymphatic glands, or to form metastases even in cases in which the tumor has become very extensive locally. It may be mentioned here that in 73 per cent. of the permanent cures obtained at the Tübingen Clinic the glands were not removed, although the disease had existed from 1 to 4 years prior to operation. Of the 60 cases reported by Küttner 53 were operated upon, with 3 deaths, a mortality of 5.6 per cent. Excluding these, as also those that could not be traced, there remain 37 cases, 15, or 40.5 per cent., of which died of recurrence; while 22, or 59.4 per cent., were permanently cured, *i.e.*, they remained well and free from recurrence upward of 3 years. Of these, 9 died of other causes within 3 to 29 years after operation. Thus there are 13 still living free from recurrence, the youngest of them 3 years and 6 months after operation, all others having lived longer: 3 upward of 20 years after operation; 2, 10 years, and these were operated upon at the age of 70 and 71 years, respectively, showing that age need not deter us from operating.

As to the 15 cases that died of recurrence, details are missing regarding 3. Of the remaining 12, 11, or 91.7 per cent., had a recurrence in the glands. The rapidity with which recurrence followed operation is remarkable, in some instances within a few weeks.

The question as to the advisability of removing the inguinal glands, Küttner believes, is of paramount importance. It is his opinion that the glands should be extirpated in all cases in which the tumor is of a malignant character and has not already too far advanced. If the tumor is of slow growth, and the glands are not enlarged, he thinks that, in view of the favorable results obtained at the clinic in the cases in which the glands were not removed, amputation of the penis may be done without removal of the glands if the patient is disinclined to allow the latter or if a more extensive operation be contraindicated. In such cases as come under the surgeon's care at a very early stage of the disease, he even considers it advisable not to remove the glands on account of the difficulty of keeping wounds in the inguinal region perfectly aseptic, so that the danger from probable wound complications may be greater than that from the cancer. In all other cases he believes the glands should be removed on both sides, as a matter of principle. He does not approve of total emasculation according to Thiersch, a procedure so often recommended of late.

* Beitr. z. klin. Chir., vol. xxvi., No. 1, 1900.

The frequency of carcinoma of the penis ranges, according to various statistics, between 1 and 3 per cent. of all other carcinomata. He found in 1,188 cases of carcinoma reported between 1885 and 1898, 27 cases, or 2.27 per cent., of carcinoma of the penis. Excluding cancer in women, the total number of cases of carcinoma in all localities was 577, with a percentage of 4.68 of carcinoma of the penis.

As regards the age at which the disease most frequently occurs, he found that out of a series of 562 cases, including his own, 4.3 per cent. had not exceeded the age of 30; 9.1 per cent. were between 31 and 40 years; 23.3 per cent. between 41 and 50; 30.1 between 51 and 60; 22 per cent. between 61 and 70; 10.3 per cent. between 71 and 80; and .9 per cent. between 81 and 90.

Five of the cases reported by Küttner gave a history of previous injury.

Cancer of the Testis.—Malignant disease of the testis may be either carcinoma or sarcoma, although sarcoma is by far the most frequent. Among 17 cases that have come under my personal observation, there has been only 1 case of carcinoma. Butlin states that malignant disease of the testis may occur in children, but seldom in children beyond 10 years of age, and rarely in adults under 30 years of age. My own experience, although the same as regards children, has not been in accord with Butlin's statement with reference to young adults, as more than one-half of my cases have been in young men between 20 and 30 years of age.

In regard to diagnosis, careful inquiry should be made as to a history of previous injury. In one-half of my own cases there was a distinct history of antecedent trauma. The physical characteristics of the tumor are in most cases sufficiently marked to make the diagnosis comparatively easy. A solid tumor, associated with more or less pain, gradually increasing in size, symmetrical in shape, especially if associated with a history of previous injury, would make one strongly suspect malignant tumor of the testis. The only disease likely to simulate it is a syphilitic orchitis or a teratoma. The slower development and previous history of syphilis would, in most cases, enable one to differentiate the conditions. The diagnosis of teratoma can be made only with the microscope. If the diagnosis is in doubt, exploratory operation should be promptly done.

Treatment.—The only treatment is castration and removal of the cord as well as cord vessels well within the internal ring. The incision which I have usually employed in these cases has been similar to that used in Bassini's operation for inguinal hernia, splitting up the aponeurosis well beyond the internal ring, which enables one to make a thorough removal of the cord. The inguinal glands, if involved—which is seldom the case in sarcoma—should be removed at the same time. Sarcoma of the testis is one of the most malignant forms of cancer with which we have to deal, and cures due to operation, even when undertaken in the early stages of the disease, are comparatively rare. Butlin has collected 118 cases with only 6 well more than 3 years after operation. The valuable statistics of Kober* show 106 cases with 9 well more than 3 years after operation. Of the 16 cases observed by myself, not a single one was cured either by operation or by toxin treatment. Recurrent sarcoma of the testis seldom attacks the inguinal glands, but almost always appears in the retroperitoneal glands. The usual course of these cases is speedy recovery from the operation, the patient feeling comparatively well for a number of months, in rare cases more than a year after operation. He then discovers a hard mass in the abdominal cavity, due to the development of a sarcomatous tumor in the retroperitoneal region. This increases sometimes to the size of a man's head, filling up a large portion of the cavity, and causes constipation from pressure. In some cases before death occurs, metastatic deposits have formed in the liver and lungs. The average duration of life is seldom more than 1 or 2 years after operation. The

* Am. Journ. of the Med. Sciences, 1899, v., p. 35.