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TUBERCULOUS OCCLUSION OF THE OESOPHAGUS, WITH
PARTIAL CANCEROUS INFILTRATION.

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(From the Pepper Laboratory of Clinical Medicine, No. 7.)

ON December 3, 1895, was admitted to the University Hospital a Russian cigarmaker, aged forty-two years, who had been seven years in America.

His family history had no bearing on the case, and was entirely good. His father died at the age of sixty-eight, of pneumonia. His mother was killed in an accident, and his brothers and sisters, five in number, were living and well. There was no history of consumption or cancer in near relatives.

His personal history up to March, 1895, was good, and he could remember no serious illness. He had never suffered any injury to the oesophagus. Syphilis was denied, and he had no evidences of it.

In March, 1895, he had a severe and somewhat protracted cold. From this he recovered, but noticed, almost at once afterward, a feeling of constriction and oppression in his throat. Later he found swallowing was becoming difficult, and increasingly so. Once, upon attempting to force down with his finger a piece of meat that had caught in his throat, he vomited, and the vomit contained blood. With this exception there was never vomiting, regurgitation, or discharge of blood. Severe pain was never present, and the history was solely that of dysphagia of increasing degree and with moderate loss of strength up to July, 1895. At that time his voice became weak and hoarse, and he found, for a time, he could not swallow even milk, and his strength failed so rapidly he had to give up work. Not long after he again became able to swallow liquids, but could never afterward take solid food. The hoarseness persisted and increased, as did the loss of flesh and strength, and in September he was admitted to the Jefferson Hospital, where the stenosis was diagnosticated and a gastric fistula established by Dr. Keen, with entirely successful operative result.

He recovered well from the operation and left there six weeks after admission, and had since been fed through the tube in his fistula. His general condition, however, grew worse, and upon admission to the

University Hospital he was anæmic and much emaciated, his pulse weak and temperature subnormal, and his voice very weak and hoarse.

He complained only of his weakness, an absolute inability to swallow, and of a feeling of oppression in the chest that he could not exactly localize. He had, however, a frequent, hawking cough, with profuse expectoration, largely saliva, containing some thick mucus and pus. The examination of the œsophagus by bougie showed an impassable stricture at its commencement. The cervical glands were enlarged and two of them were softening.

Over the front of the chest on both sides the percussion-note was hyper-resonant. Posteriorly there was slight dulness at the vertebral border of the left scapula and beneath the ridge of its spine. Elsewhere the note was normal. The tactile fremitus was alike on both sides. Air seemed to enter both lungs equally, and the breath-sounds were themselves normal, but accompanied by some dry râles and inspiratory crackles in both apices posteriorly.

The heart-sounds were clear and rapid; the second sound accentuated. The cardiac dulness was of normal area.

The stomach-area, determined by percussion and auscultatory percussion, was somewhat enlarged, reaching from the fifth interspace downward to a finger's breadth above the umbilicus. There was a healthy gastric fistula holding a rubber tube.

Examination of his sputum for tubercle-bacilli was negative. His urine was normal in appearance and contained neither albumin nor sugar.

The examination of his blood showed 3,272,000 red corpuscles, 6250 white, and 40 per cent. hæmoglobin. He improved for a few days, and was examined by Dr. Grayson by laryngoscope. Dr. Grayson reported thickening of the ary-epiglottic folds and a complete occlusion of the œsophagus in the transverse diameter at its junction with the pharynx. The mucous membrane above was normal, and there was no ulceration, proliferating growth, or other evidence of malignancy. This led to the diagnosis of tuberculosis as the cause of stenosis. Especial thought was given to compression from enlarged glands, but from the situation and completeness of the occlusion it was held probable that there was at least a coexisting tuberculosis of the wall of the œsophagus. Operation was considered with the view of removing any glands that might be causing compression, and, if possible, reopening the lumen. His condition, however, was too bad to warrant operation, and it was deferred while endeavoring to improve his general strength; but his cough increased and he began to show some irregular elevation of temperature, and the respirations grew more frequent. A few days after admission tubercle-bacilli were for the first time found in the sputum. He was losing weight and growing weaker. His breathing and voice were so weak that the lung-signs were difficult to elicit, but six weeks after admission there was added to his previous signs dulness, with prolonged expiration at the middle of the right scapula. At this time abscesses formed in the glands in the neck on the right side, and were opened. The pus showed no tubercle-bacilli, but many staphylococci. There was a continuous slight increase in the signs in the lungs and loss in weight and strength until, on March 18, 1896, he grew decidedly worse, with signs of catarrhal pneumonia of the right base. Next day

this was outspoken and the left base was partially consolidated, and he died two days later.

The repeated examinations of his stomach-contents were carried out at various times after the administration of different test-meals—milk, milk and eggs, Boas oatmeal soup, and the same with egg-albumin added and the Ewald-Boas bread and water. The results varied but slightly at any time. On one occasion only, forty-five minutes after the administration of milk and eggs, was free hydrochloric acid shown by the phloroglucin-vanillin test, and this was but a faint reaction. The total acidity varied but little at any time, and was very low, ranging, expressed after the manner of Ewald, from 6 to 10. Quantitative estimations of the total hydrochloric acid by v. Jacksch's¹ modification of Sjoquist's method and that attributed by v. Leube² to Braun gave as its highest point 0.0329 per cent. and from this downward, some loosely combined chlorides always being present.

Lactic acid was never present, using both Boas's³ and Uffelmann's test. Starches were not changed, and the gastric contents never showed any digestive action upon albumin, and tests for peptone at any interval were always negative.

The milk-curdling ferment was present, as was its zymogen, but both in small quantity and not active. With Boas's⁴ method for their quantitative determination a dilution of 1 to 5 was sufficient to stop the action of the ferment and 1 to 15 of its zymogen. The motor activity seemed to be decidedly excited, as test-meals containing a pint of fluid and removed after fifteen minutes, half an hour, and so on to an hour and a half, showed, at the latter interval, never more than 3 or 4 c.cm., and only occasionally was there more remaining after one hour. After half an hour the quantity was usually about 20 c.cm. This was perhaps explained post mortem by the partial hour-glass contraction of the stomach. Probably more remained in the lower section, but could not be reached by the tube.

The results of the examinations for free hydrochloric acid are like those of Neschaieff,⁵ who found it absent in four cases of cancer of the oesophagus. Ewald⁶ also investigated the HCl production in a number of patients with cancer of the cardia upon whom gastric fistulæ had been made, and found it always absent whether the disease was upon the gastric or oesophageal surface of the cardia, and in a number of cases of the same nature examined by means of the stomach-tube he found the same lack of digestive activity. Combining these results with those of Neschaieff, he concluded that the introduction of food into the stomach through a gastric fistula would result only in its fermentation; he therefore advises that the fistula be established as near as possible to the pylorus, so that the tube, and thus the food, may be car-

¹ v. Jacksch : *Klinische Diagnostik*.

² v. Leube : *Diagnose der Innerenkrankheiten*, Bd. i. S. 272

³ Boas : *Deutsch. med. Wochens.*, 1893, No. 34.

⁴ Boas : *Diagnostik u. Therapie der Magenkrankheiten*, Th. i., 3te Auflage, S. 189.

⁵ Neschaieff : *Lancet* (abstract), June 4, 1887.

⁶ Ewald : *Klinik der Verdauungskrankheiten*, 1893, Bd. ii. S. 148.

ried directly into the duodenum. On the contrary, Riegel¹ has examined two cases, Sidney Martin² one, and Boas³ one, the location of the disease not mentioned; Mintz⁴ three of the cardia and Boas⁵ one in this location, in none of which cases was there any change in the HCl from the normal. In one of Mintz's cases the motor activity of the stomach was decreased, and in one no free HCl, but the combined chlorides normal, while Riegel⁶ had a further case in which the secretion was at one time lessened but afterward normal.

There seems, therefore, no definite present knowledge of an ill effect of even cancer at the cardiac end of the oesophagus upon the gastric functions, while it would appear very unlikely that the pathological condition found in this case would have any specifically harmful action. The conditions found here seem much more probably due to the man's general condition and to the absolute nature of the occlusion, which not only prevented his taking nourishment in the normal manner and condition, but, perhaps more important, prevented the entrance of saliva into his stomach with or without his food, and the preparation of it by mastication. Sticker⁷ found in a case with very poor secretion of saliva and symptoms of gastric insufficiency that the gastric symptoms quite disappeared and the patient was restored to full health within two weeks after re-establishing free secretion of saliva with jaborandi. He tested the condition of the gastric contents in another case after a test-meal administered through a stomach-tube, and after which no saliva was swallowed, and after the same meal masticated and swallowed with saliva, and found much better secretion and motor action after the latter. Biernacki⁸ has elaborated the latter experiment, and Friedenwald⁹ has repeated Biernacki's experiments, both administering first the test-meal without saliva, and, after expressing this, washing out the stomach; and administering the same meal with saliva Biernacki found, in health, the secretion of HCl and the motor activity much greater when the meal was masticated. Pepsin digestion was but little increased, and the absorption, tested by potassium iodide, was the same in either case. In a number of cases of disease, except in cases of gastrectasia and carcinoma and in pulmonary tuberculosis, he found the motor activity and secretion of HCl much increased, and the activity of the pepsin was even three times as great as with absence of saliva. Friedenwald got, in general, much the same results, and also investigated the action of the

¹ Riegel: *Zeitschrift f. klin. Med.*, Bd. xii. S. 434.

² Sidney Martin: *Functional and Organic Diseases of the Stomach*, p. 87.

³ Boas: *Deutsch. med. Wochensch.*, 1893, n. 39, 5.

⁴ Mintz: *Wiener klin. Wochensch.*, 1896, n. 3.

⁵ *Loc. cit.*

⁶ *Loc. cit.*

⁷ Sticker: *Volkmann's Sammlung klinische Vorträge*, 1887, 297.

⁸ Biernacki: *Zeitsch. f. klin. Med.*, Bd. xxi., Heft 1 u. 2; *Zeitsch. f. Biologie*, xxvii. S. 49-71.

⁹ Friedenwald: *Internat. Medical Mag.*, August, 1896.

milk-curdling ferment and found it much greater when the meal had been masticated without saliva; it took from five to thirty minutes longer to coagulate milk.

This increased activity of the gastric functions is present even after the destruction of the ptyalin, as Biernacki has shown, and is therefore not due to this action, nor is it due solely to the presence of the saliva, as meals containing saliva but not masticated brought forth much less gastric action than those masticated. Biernacki holds this due to a regulation of the reaction of the food taking place within the mouth during mastication, while Friedenwald's experiments do not confirm this, and he simply refers it to an unknown effect produced during mastication.

That there is a definite increase of the gastric functions caused by mastication and in salivation can scarcely be doubted, and it seems probable that the experiments would have shown a greater increase had the diurnal variation in activity been excluded by making several observations upon each case with the two test-meals administered on separate days, instead of by administering both on the same day, the meal with saliva immediately following that without. The latter method would seem to the disadvantage of the meal with saliva.

The post-mortem conditions in our case were as follows:

Body much emaciated; fistulous opening in the epigastrium. The deep group of cervical lymphatic glands cheesy and suppurating.

Thorax: about 200 c.cm. of clear serum in the right femoral cavity; a small amount in the left.

Pericardium moderately distended with straw-colored fluid.

Heart: weight grm. 160; small and dark. The visceral pericardium wrinkled; subpericardial fat along bloodvessels white and gelatinous; valves healthy.

Lungs: right apex firmly adherent to the deep cervical tissues; on section contained a number of hard sclerotic and calcareous nodules. The lower part of the upper lobe normal. The middle lobe intensely œdematous; the lower lobe congested, œdematous, and irregularly consolidated in lobular areas. At its apex same thickening. The left apex less adherent, in other respects similar to the right; bullous emphysema of the superficial portion; distinct lung-stones in places. Lower lobe similar to lower right lobe. At its topmost part consolidation of fibrous character, and on section tubercular-like areas.

Abdomen: firm adhesions between the stomach and abdominal wall for a half-inch about the site of the fistula; otherwise the peritoneum normal. Kidneys, suprarenals, and spleen normal. Liver small and congested.

The œsophagus, larynx, and stomach removed *en masse*. The stomach hour-glass shaped, due apparently to contraction of new-formed tissue at the seat of operation. The pyloric part of the stomach the size of a small orange; the part above the constriction—the body and fundus—was alone about the size of a normal organ. It contained gas and curds of milk.

The *œsophagus*: patulous and normal as high up as the level of the arch of the aorta. Above this point and to the junction with the pharynx—to a point just beneath the vocal cords—the lumen had entirely disappeared and its situation could not be traced. The surrounding tissues and œsophageal walls had formed a band of firm fibrous tissue about a half-inch in thickness and one and a half inches in breadth. The whole mass was firmly bound to the vertebrae.

The *larynx*: the ary-epiglottic folds were thickened and œdematous. Cricoid cartilage thickened.

Pathological diagnosis: tuberculosis of the larynx, cervical glands, œsophagus(?), and lungs, deglutition-pneumonia. Upon microscopic examination of the lungs was found the confirmation of the macroscopic diagnosis. At the apices was great thickening, with obliteration of many of the air-spaces, and thickly scattered throughout the tissue were many collections of round- and giant-cells, a few of which masses were becoming cheesy in the centre. In the lower lobes catarrhal pneumonia, with occasional miliary tubercles.

The sections of the growth from portions taken from the junction with the normal mucous membrane show at once cancerous tissue in a general fibrous tissue-basis. The fibrous tissue is exceedingly dense, arranged in bands with a little areolar tissue between the bands, and in this areolar tissue and about the cancer-nests there is a marked, often quite dense, round-cell infiltration, here and there somewhat in clumps, but not characteristic. The epithelial cells are, at the periphery, almost entirely in cancer-nests, in some places irregularly scattered and seemingly remnants from the œsophageal mucous membrane. Below the free edge there is not so distinct an arrangement in nests of cells, but there are long tongues of cancerous tissue extending into the here still more compact fibrous tissue. There is an extremely large number of pearly bodies in and near the cancer-nests and prolongations; in a few of the nests a good deal of formless débris, or a goodly number of round-cells among the epithelial. In numerous places there are well-defined clusters of round-cells, with sometimes a few rather irregularly arranged epithelial cells in or near the centre, sometimes a distinctly formed nest at this point. Sections from deeper within the general mass show, at the end toward the free edge, the process in much the same condition as in the deeper portions of those described—the cancerous tissue mostly in the form of prolongations, with many pearly bodies; much fibrous tissue, irregularly arranged; and still much round-cell infiltration, though not so dense as in the free edges. This ceases rather sharply, and the fibrous tissue beyond is arranged transversely and in distinct bands, separated by areolar tissue, all freely infiltrated with round-cells, but showing almost no cancerous tissue. In some sections there are no epithelial cells, separate or in groups; in some one or two small nests, and in some three or four, but never a large number. But the round cells here, and more especially on the lateral borders, assume a more interesting character. They are frequently collected in small, dense masses, sometimes not well outlined, but occasionally well defined and irregularly round, with an occasional giant-cell near or beyond the periphery of the group. Some of these tubercle-like masses are undergoing fibroid change. Many are situated at a distance from the cancerous tissue, so that they do not seem dependent upon its irritant action for their formation, and they are largely at the lateral borders.



Section from the junction of the cancerous and tuberculous tissues, showing the cancer-nests suddenly ceasing and replaced by fibrous tissue, with a good deal of round-cell infiltration, the latter here not showing any typical tubercles though somewhat clumped.



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Sections were stained several times for tubercle-bacilli, without positive result; but some were finally found in which there were two or three of the bacilli to a slide. These were all near the exterior of the growth and in the neighborhood of the tubercles.

From these appearances the original cause of the disease was evidently tuberculosis, while the cancer subsequently infiltrated the occlusion. That the cancer was primary is very improbable, both from its evident appearance, microscopically, of infiltration of a previously existing mass and from the history of cancer being here as elsewhere one of inexorable growth and onward progress, ulceration, and sloughing. Here the central fibrous portion, at least, is in all active effects healed.

The possibilities that the stenosis might have been originally syphilitic or subsequent to trauma seem excluded by the lack of history of syphilis and of its clinical or post-mortem lesions, and, as to trauma, only a very extensive injury could have produced so extended contraction, and this must have left a vivid memory of its occurrence, while he stated that he had suffered from no injury.

That the original tubercular disease had occasion for its origin given by partial obliteration of the lumen by an enlarged gland and abrasion of the projecting portion is possible. But, although the suggestion of the possibility of obstruction of the œsophagus by enlarged glands was first made by Vesalius, the number of cases in which this condition has been found is small. Barety,¹ in twenty-six cases of compression of important structures by bronchial glands, found the œsophagus involved but once; while Hofmøkl,² who had two cases, could find but one other to add to the list, and that not severe.

Körner³ considerably increased these figures two years later with two cases of his own, of which, however, but one was examined post mortem, and nine others from literature. If to these be added Habershon's, which Körner mentions, but leaves out of the count, Barety's and one reported by Janeway,⁴ the known number at that time remains very limited. This consideration would, however, include only those cases in which there is compression. Traction from contracted glands, which did not exist in our case, is far more frequent.

Microscopic findings resembling ours have been described but three times, and of these the account of Tissier⁵ is an incomplete one of a cicatricial contraction of the œsophagus at the level of the tracheal bifurcation, with a fistulous opening into a pouch caused by suppurating bronchial glands, which pouch also communicated with the right bronchus. The upper and lower borders of the stenosis showed slight can-

¹ Barety : *L'adénopathie trachéobronchique*.

² Hofmøkl : *Archiv f. Kinderheilkunde*, 1882-'83, iv. S. 81-87.

³ Körner : *Deutsch. Arch. f. klin. Med.*, 1885, n. 37.

⁴ Janeway : *Trans. New York Path. Soc.*, November 27, 1872.

⁵ Tissier : *Annales des maladies de l'oreille, du larynx, du nez et du pharynx*, Nov. 1887.

cerous infiltration. Further description is not given. Cordua¹ and Zenker² have reported each a case of cancer in which miliary tubercles and tubercle-bacilli were present. Both, however, believed the tuberculosis was secondary to the cancer—Cordua thinking the tubercular infection came from the lungs through the lymph-channels, while Zenker gave the much more acceptable etiology of destruction of the mucous membrane by the cancer, thus giving entrance to the bacilli from the lumen of the œsophagus.

Tuberculosis of the œsophagus, of itself, is somewhat more common, though still very rare. Many works on pathology, as Cornil and Ranvier,³ Ziegler,⁴ Hamilton,⁵ and others dismiss it with the note of its occurrence and rarity, or do not mention it at all. Orth⁶ gives it consideration and thinks it more common than usually supposed. He has himself observed three cases which were confirmed by microscopic examination, and in two of them tubercle-bacilli were found.

Birch-Hirschfeld⁷ has observed in a man dead of tuberculosis of the lungs tuberculous ulcers of the larynx, pharynx, and upper third of the œsophagus.

Of clinical works Cohen⁸ mentions it as a cause of stricture, Osler⁹ refers to it as a pathological curiosity, while v. Leube,¹⁰ Strümpell,¹¹ Eichhorst,¹² and others do not mention it.

Such statistics as are available warrant this treatment, the most extensive being those of v. Willigk¹³ and Sänger.¹⁴ The former examined 1317 records and found but one case, while Sänger found five cases in 1226 records. He included the cases reported by Chvostek¹⁵ and Paulicki,¹⁶ which were not verified by microscopic study, and the one case v. Willigk found was not verified.

K. Zenker¹⁷ considered this infrequency due to the short time the ingesta remain in the œsophagus, and, more especially, to its thick layer of epithelium, which prevents, in ordinary conditions, the abrasions which might give entrance to the bacilli. In support of this, and as evidence of the rôle played by injuries of the mucous mem-

¹ Cordua : *Arbeiten aus dem Patholog. Inst.*, Göttingen, 1893, S. 147.

² Zenker, K. : *Deutsch. Arch. f. klin. Med.*, Bd. xvii. S. 191.

³ Cornil and Ranvier : *Manuel d'histologie pathologique*.

⁴ Ziegler : *Lehrbuch der Pathologischen Anatomie*.

⁵ Hamilton : *Text-book of Pathology*.

⁶ Orth : *Allgemeine Pathologie*, 1887, p. 681.

⁷ Birch-Hirschfeld : *Pathologische Anatomie, Spec. Th. 2te Hälfte, 4te Auflage*, S. 620.

⁸ Cohen : *Ashhurst's Encyclopedia of Surgery*, vol. ii.

⁹ Osler : *Practice of Medicine*, p. 240.

¹⁰ v. Leube : *Diagnose der Inneren Krankheiten*.

¹¹ Strümpell : *Pathologie u. Therapie der Inneren Krankheiten*.

¹² Eichhorst : *Specielle Pathologie u. Therapie*.

¹³ v. Willigk : *Prager Vierteljahresschrift*, 1856, xliii. 2 u. 3.

¹⁴ Sänger : *Archiv f. Heilkunde Jahrgang*, xix. S. 448. Anmerkung.

¹⁵ Chvostek : *Oesterreich. Zeitsch. f. praktische Heilkunde*, xiv. S. 497.

¹⁶ Paulicki : *Virchow's Archiv*, Bd. xlv. S. 373.

¹⁷ Zenker, K. : *Deutsch. Archiv f. klin. Med.*, 1895, lv. Festschrift.

brane, he refers to the cases reported by Breus,¹ occurring subsequent to the destruction of the mucous membrane by swallowed lye; Eppinger,² where the tuberculosis was found beneath a mass of thrush, and Kundrat, in which the original injury was due to sulphuric acid; and, further, to his own case and Cordua's, previously mentioned, in which cancerous ulceration preceded the development of tuberculosis. Cases have, nevertheless, been reported since 1716, when Mangetus³ described a case of which a meagre abstract is given by Mauchart in his dissertation on "*Struma Œsophagi*." The diagnosis of the condition was at that early date impossible, of course. It was described, however, as a complete occlusion of the œsophagus for several inches by its conversion into a fibrous band, all lumen having disappeared. This was thought to be due to pressure from enlarged glands and their subsequent contraction, including the œsophagus, the whole mass becoming fibrous. This description bears great resemblance to our case, but must end with resemblance. Beuller's case, which Mauchart reports at the same writing, can be dismissed at once as in all probability cancer with gangrene of neighboring organs.

Sommer's⁴ case, reported undiagnosed, was perhaps cancer, but at this day would have been worthy of careful study. There was an ulcer of the pharynx with a callous base, and in the œsophagus just below this were a number of tubercles containing cheesy matter. Some of these had ruptured and left superficial ulcers. There was an opening below communicating with the trachea, and the mucous membrane of the latter was ulcerated in spots. The other organs were normal.

Subsequent to this report the literature is barren of suggestive cases until those of Chvostek⁵ and Paulicki⁶ in 1868. Both of these showed ulcers of the œsophagus of distinctly tubercular, gross appearance and in tubercular subjects. Chvostek's, however, does not appear to have been examined microscopically, while Paulicki could only exclude cancer by his histological examination, and could not find any distinct evidence of tuberculosis. Kraus,⁷ in the following year, published as tuberculosis a case in which he found an ulcerated "tubercular" ring, two inches in width and four inches above the cardia, and which communicated by a small opening with cavities in the middle and lower lobes of the right lung. The ulcer showed a variety of what he considered tubercular stages. The case is certainly suggestive, but on these doubtful appearances and in the absence of microscopic examination it

¹ Breus: Wiener med. Wochensch., 1878.

² Eppinger: Prager med. Wochensch., 1881, n. 51 u. 52.

³ Mangetus: Theat. Anat., 1716. Quoted by Mauchart, Haller's "*Disputationes Chirurgicæ*," 1743.

⁴ Sommer: Rust's Magazine f. d. gesammte Heilkunde, 1823, xv. S. 364.

⁵ Chvostek: loc. cit.

⁶ Paulicki: loc. cit.

⁷ Kraus: Allgemeine med. Zeitung, 1869, n. 19.

cannot be positively considered tubercular. The next case, that of Breus,¹ is the first one with really strong claims to acceptance. In this there were ulcers of the pharynx, œsophagus, and stomach, in a case of generalized tuberculosis, and the histology of the œsophageal ulcers was that of tuberculosis. There was a history of injury from drinking lye and of stenosis coming on subsequent to this.

A case of Peter's² seems very probably actual tuberculosis, though only the gross lesions were described. They were: stenosis from drinking sulphuric acid, with several tubercular-like ulcers in the œsophagus, in a subject with pulmonary and intestinal tuberculosis. Eppinger's³ seems almost secure in diagnosis—a woman with advanced phthisis and with her œsophagus almost stopped up with a mass of thrush. Beneath this were found tubercles and tubercular-like ulcers over the entire length, and the histological appearance was that of tuberculosis. Adding to these the cases of Spillmann⁴ and Frerichs⁵ quoted by Flexner, of which Frerichs seems especially probable, we reach the stage when the existence of tuberculosis of the œsophagus was fully demonstrated by Weichselbaum⁶ by his discovery of the presence of the bacilli in his case, which showed the following conditions: tubercular enlargement of the supraclavicular and mediastinal glands, a moderate degree of tuberculosis of both lungs, and a few ulcers in the ileum. Three finger-breadths above the bifurcation of the trachea there were four minute openings in the trachea and eight in the œsophagus. These communicated with purulent glands between the trachea and œsophagus; above and below this, down to the cardia, there were myriads of small tubercles, gray or cheesy, and many tipped with small ulcerations. Two more were reported by Beck⁷ of generalized tuberculosis, with involvement of the œsophagus, in one of which it apparently extended from the pharynx. These were fully verified. Carstens⁸ makes the doubtful and unproved statement that there are in the post-mortem records at Kiel three undoubted cases of tuberculosis of the pharynx and two more that are probably such. Mazzotti⁹ examined three cases, one of miliary tuberculosis with miliary tubercles in the œsophagus, one of advanced tuberculosis of the lungs with ulceration low down in the œsophagus and tubercles higher up, and a third, likewise of advanced pulmonary phthisis, with added intestinal tuberculosis. Here the œsophageal disease was in the form of a ring of elevated tissue of about three-quarters

¹ Breus: loc. cit.

² Peter: *Leçons de clinique Médicale*, 1879, t. ii.

³ Eppinger: loc. cit.

⁴ Spillmann (quoted by Flexner): *De la tuberculisation du tube digestif*. These, Paris, 1878, p. 97.

⁵ Frerichs (quoted by Flexner): *Beiträge zur Lehre v. d. tuberculose*, 1882.

⁶ Weichselbaum: *Wiener med. Wochensch.*, 1884.

⁷ Beck: *Prager med. Wochensch.*, September 27, 1884.

⁸ Carstens: *Beiträge z. Lehre u. Statistik der Oesophagusgeschwüre*. Inaug. Diss., Kiel, 1887.

⁹ Mazzotti: *Rivista clinica*, Januar, 1885.

of an inch in diameter. Below this were a number of fine swellings. In all three cases he found tubercle-bacilli and the appearances of tubercular disease under the microscope.

To these must be added the three cases which Orth¹ mentions, in two of which the diagnosis was completed by the discovery of the bacilli and the third presented all the histological appearances of tuberculosis, and the case of Birch-Hirschfeld, previously cited. Flexner² added a case in which there was the interesting clinical observation that in washing out the pleural cavity, after resection of a rib for pyopneumothorax, portions of previously ingested food came away in the washings. Post mortem he found tuberculosis of the cervical and bronchial glands, tubercular pleurisy with pyopneumothorax, gangrene of the pleura, and intestinal tuberculosis of recent origin. In the Œsophagus were found a large perforation into the pleura through one ulcer and another ulcer which reached only to the muscular coat. The edges and bases were smooth. Living maggots were found in the ulcers. Histologically, the non-perforating ulcer had undermined the mucous membrane and submucosa, which were lined with a layer of epithelium extending onto its base. In this projection in the base of the ulcer and in the smooth muscular fibres there were masses of epithelioid and lymphatic cells with some giant-cells. In the perforating ulcer likewise were tubercles found. The bacteriological examination was confirmatory. Zenker's³ three cases were reported recently. In the first the diagnosis had been made during life from dysphagia occurring in a case of pulmonary tuberculosis, with enlarged glands in the neck and with subsequent extreme pain on swallowing, radiating toward the ears. The sound met an impassable obstruction 22 cm. from the teeth. Post mortem there were in the lungs all stages of tuberculosis, with cavities in the apices. The Œsophagus was stenosed from the level of the cricoid for 4 cm. downward, admitting only the finger-tip. There was within this a ring-like ulcer encircling the whole circumference, the edges of which were irregular, warty, and somewhat undermined. The base seemed cicatricial tissue. It was very tightly adherent to the last three cervical vertebræ, and the tissue here looked exactly like scar-tissue. The ulcer involved only the mucous membrane. In the middle of the Œsophagus was a swelling the size of a bean, discharging thin pus.

Under the microscope, surrounding the ulcer the epithelium was much thickened, and there were prolongations running out into the mucous membrane, but never reaching beyond it—the same picture as in lupus of the skin. At the beginning of the ulcer itself the epithelial covering ceased and there was round-cell infiltration, with occasional

¹ Op. cit.

² Flexner: Johns Hopkins Hospital Bulletin, 1893, No. 28.

³ Zenker, K.: Deut. Archiv f. klin. Med., Bd. iv., 1895, Festschrift.

epithelial tongues left from the destruction of the mucous membrane. The whole was filled with round-cell infiltration in which there were many tubercles, which were especially characteristic in the base of the ulcer. Many contained numerous giant-cells which were mostly of lymphoid tissue; many others were largely made up of epithelioid cells. Some others were small necrotic masses. Both in the tubercles and granulations were many tubercle-bacilli, sometimes in great numbers, and especially on the surface of the ulcer. They were often enclosed in the cells. The process was localized to the mucosa and sub-mucosa, though there was a little round-cell infiltration of the muscular layer. The purulent swelling was a tubercular mass.

In connection with his previously mentioned emphasis of the causative part played by traumatism, he reminds us that the part here affected is especially liable to injury from its situation just back of the cricoid.

His second case presented no œsophageal symptoms, and was accidentally discovered. There was advanced tuberculosis of the lungs, trachea, larynx, and intestines. Opposite the bifurcation of the trachea was a slight narrowing of the œsophagus, and at this point there was a prominence with an ulcer the size of a finger-nail at its top. Surrounding this were small, yellowish masses. The whole thickness of the swelling was filled with caseous matter and tubercles were seen at a little distance. Enlarged and infiltrated bronchial glands surrounded it, and the process was evidently due to an extension from them. The further examination showed typical tubercles and tubercle-bacilli in large number.

In the third case the lungs, pleura, and intestines were tuberculous and there was a mass of tubercular glands in the neck. Three perforations existed in the œsophagus near its central portion, communicating with the bronchi and trachea. About these the mucous membrane was infiltrated and yellow. The tissue here was full of tubercles, necrotic granulation-tissue, and tubercle-bacilli.

Fränkel¹ published a case not long since of a man dying of pulmonary and intestinal tuberculosis, in whose œsophagus were many tubercles, some superficially eroded, and a large number of small ulcers. The microscopic appearance was that of tuberculosis, with occasional cheesy degeneration, in all tissues down to the muscular layer. Giant-cells and tubercle-bacilli were present in small numbers.

Glockner² has given a description of a rare localization of the process, the muscular layer only being affected; and Daniel,³ most recently, examined the organs of a woman aged seventy-six years, confirming a clinical diagnosis of pulmonary tuberculosis with broncho-pneumonia,

¹ Fränkel: Münch. med. Wochensch., 1896, n. 2.

² Glockner: Prag. med. Wochensch., 1896, n. 11-13.

³ Daniel: Journ. de Sciences médicale de Lille, 1896, n. 22, p. 530.

and finding also an ulceration, nearly four inches in length, of the posterior wall of the œsophagus, with excavated base, which was eroded and of reddish color. At its margin and in the neighborhood were many miliary granulations. Like granulations of less number were present on the anterior wall up to near the pharynx. At the crossing of the right bronchus was a circular opening, almost 1 cm. in diameter, communicating with a cavity formed by a broken-down and discharging peribronchial gland. The stomach was dilated, its mucous membrane slate-colored, and it contained numerous granulations of apparently tuberculous nature.

Further, the case published by Heryng¹ in 1892 of "tuberculosis of the œsophagus resulting in recovery" is of interest, but inability to procure an abstract in a familiar language prevented examination of the diagnosis, which must have been very insecure without a study of possible removed portions.

Of those cases described, none before Breus give sufficient evidence of their nature for acceptance as diagnosticated. To add to the errors possible, there are cases of sarcoma of the œsophagus reported by Miller,² Rolleston,³ Chapman,⁴ Oppenheimer,⁵ Ogle,⁶ Targett,⁷ and Shaw,⁸ among which the last two are of especial interest. Targett's exhibited an extensive and advanced tuberculosis of the lungs and a marked thickening of the œsophageal wall for several inches, the surface of this thickening being ulcerated; while Shaw's was likewise an ulcer beginning one inch below the cricoid and extending downward for three inches. In both cases the microscope showed sarcoma, chiefly of round-cells.

With Breus the security of the diagnosis becomes, it seems to us, sufficient for its acceptance, and certainly in all the cases subsequent to his, with the exception of those of Spillmann, Frerichs, and Peter. The two latter, in the apparent lack of microscopical examination, must be considered doubtful. The original report by Spillmann has not been accessible to us, but from Flexner's description there would seem to be much doubt of its nature.

Certain other cases, such as those described by Vigla,⁹ Löschner,¹⁰ Uhde,¹¹ Voelcker,¹² Zenker,¹³ Pitt,¹⁴ and Penzoldt,¹⁵ in which there was

¹ Heryng: *Gaz. lek. Warszawa*, 1892, 2, S. xii., 678.

² Miller: *Trans. Med. Soc. of Pennsylvania*, 1884.

³ Rolleston: *Trans. Path. Soc. of London*, vol. 44, p. 65.

⁴ Chapman (quoted by Butlin: "Carcinoma and Sarcoma," p. 160).

⁵ Oppenheimer: *Louisville Med. News*, 1879, vii. p. 74.

⁶ Ogle: *British Med. Journ.*, March 31, 1896.

⁷ Targett: *Trans. Path. Soc. of London*, vol. 40, p. 76.

⁸ Shaw: *Ibid.*, vol. 42, p. 90.

⁹ Vigla: *Union Médicale*, 1855, p. 290.

¹⁰ Löschner: *Virchow's Jahresbericht*, 1868, ii. S. 643. ¹¹ Uhde: *Deutsche klinik*, 1856, n. 3.

¹² Voelcker: *Trans. Path. Soc. of London*, vol. 42, p. 87.

¹³ Zenker: *v. Ziemssen's Handbuch d. Spec. Pathologie u. Therapie*, Bd. vii., Th. 1., Anhang, p. 187.

¹⁴ Pitt: *Trans. Path. Soc. of London*, vol. 39.

¹⁵ Penzoldt: *Virchow's Archiv*, Bd. lxxxiii. p. 488.

perforation of the œsophagus, caused, except in Vilga's case, by abscesses of probable tubercular origin, can scarcely be considered because of the lack of description of any gross or microscopic lesions pointing to tuberculosis, but that there was tubercular infiltration of the wall in some of these cases is almost indubitable. As to the diagnostic significance of the examination of these cases there is little to be said. If a case of phthisis exhibit painful deglutition, and especially with evidence of some stenosis, a suspicion of tuberculosis of the œsophagus would be aroused, and the not infrequent occurrence of the disease at the uppermost portion of the gullet would point to the use of the laryngoscope as an aid, as in our case, in the establishment of a clinical diagnosis. Stenosis is not common, however, as beyond our report only those of Paulicki, Spillmann, and Zenker (in his first case) contain any description of it in distinct degree due apparently to the tubercular process, unless Mangetus's ancient but interesting case be seriously considered in this connection. This latter seems to offer the only marked parallel to ours in mechanical results from any cause. A goodly number of very extreme cases of stenosis may be found, as in Schomaker's,¹ where there was in a boy of nine years a stenosis two inches in length admitting only a pin, the walls of the œsophagus being much thickened by scar-tissue; and in Shaw's,² where a squamous epithelioma shaped like a flattened cone two and one-half inches in length, ragged and sloughing at its free border, choked up the whole lumen. Veggia³ had a patient whose œsophagus was so narrowed that she had to be nourished by the rectum. Post-mortem examination showed a hard, fibrous ring at the cardia that admitted only a No. 1 sound.

Pollock⁴ quotes a case of Liston's, of external stenosis of the pharynx, in which there were an approximation of the upper horns of the thyroid and great hypertrophy of the constrictors of the pharynx, the stenosis allowing only the passage of a goose-quill. The patient had been under Cruikshank and John Hunter and treated for a long time, and died at nearly eighty years of age. Harvey⁵ published an interesting report of stenosis that would admit only a No. 2 urethral bougie, which was caused by drinking concentrated sulphuric acid forty years before, and was practically cured by treatment.

Roe⁶ had a case of fibroid stricture in which the lumen was of the size of a small lead-pencil, and quotes Poncet,⁷ who had described a stenosis admitting only a very fine probe, the cause of which was hyper-

¹ Schomaker: St. Petersburg med. Wochensch., 1889, n. f. vi. p. 116.

² Shaw: Trans. Path. Soc. of London, vol. 42, p. 89.

³ Veggia: Gazzetta medica di Torino, 1889, p. 385.

⁴ Pollock: Holmes's System of Surgery, 2d ed., vol. iv. p. 491.

⁵ Harvey: Birmingham Med. Review, 1889, p. 225.

⁶ Roe: New York Medical Journal, March 14, 1891.

⁷ Poncet (quoted by Roe): Bull. Méd., Paris, 1888, ii. 451.

trophy of the muscular layer. Not many other cases of such extreme degree of obstruction have been published, and this is not surprising, since the disease, if cancer, and the interference with the nourishment of the patient, are usually sufficient to cause death before this grade is reached.

The conditions found in our case under the microscope have, further, an interesting connection with the question of the relation of cancer and tuberculosis in the same organism, and especially that question of the relation between stenosis of the œsophagus, usually cancerous, and tuberculosis.

Rokitansky's original contention, in which he was followed by the Viennese school, that the two diseases were antagonistic, soon brought forth an answer from Lebert,¹ who insisted that even the opposite was true, and he especially emphasized the view that tubercular subjects have an actual predisposition to cancer of the œsophagus. Behier² was quite as vehement in expressing the same view. Hamburger³ and Fritzsche followed this opinion, and Hamburger even believed any chronic affection of the œsophagus in a tubercular subject should be always very suggestive of cancer. In the light of the cases of tuberculosis of this organ that have been considered, and after examination of statistics, this latter view is entirely untenable.

It has been the province, however, of numerous French writers to defend the view that tuberculosis occurs with especial frequency in stenosis of the œsophagus from any cause, the usual cause being, of course, cancer. Peter⁴ was convinced of this, and relates four of his own cases, one of which was not examined post mortem, but had stenosis of the œsophagus with clinical signs of phthisis. Another, with a fibrous stricture, showed post mortem recent miliary tubercles. The third had cancer, and at the apices of the lungs were granulations that appeared tubercular. The fourth case was the one previously mentioned under tuberculosis of the œsophagus. He further refers to a case of Gallard's, where there was cancer of the stomach and œsophagus, with pulmonary tuberculosis, and says he has seen tuberculosis in each case of fibrous or cancerous stricture he has observed. The cause of this supposed frequency he finds not in a particular effect of cancer itself in this situation, but in the inanition resulting from the insufficient nourishment possible in such cases, and refers to v. Jaksch's not very convincing statistics of tuberculosis combined with gastric ulcer as materially reinforcing this belief.

Letulle⁵ and Leroux⁶ reported cases of carcinoma with tuberculosis,

¹ Lebert: *Traité pratique des maladies cancéreuses*, 1851.

² Behier: *Clinique médicale*, 1864.

³ Hamburger: *Medizin. Jahrbuch*, 1869, n. 18.

⁴ Peter: *Leçons de clinique médicale*, 1879, t. ii.

⁵ Letulle: *Bull. de la Soc. Anat. de Paris*, 1877, lii.

⁶ Leroux: *Ibid.*

and Leroux affirms that this evidences the possibility of a cancerous individual becoming tuberculous, but doubts the opposite, though an example of the latter is shown in Letulle's case in the same number of the journal. Michaux¹ had a case similar to Leroux's.

Porchaire² examined the records of the Anatomical Society of Paris from 1870 to 1880 and found twenty cases of cancer of the œsophagus, nine of which showed tuberculosis, in one case of the testicle alone, in another the process was old and healed; of two cases of cicatricial stricture one subject was tuberculous. He himself reports the case of a man, sixty-one years of age, who had developed upon the symptoms of carcinoma of the œsophagus those of pulmonary and, finally, general tuberculosis. The autopsy showed tubercles in the lungs, kidneys, spleen, and membranes of the brain, and a carcinoma of the œsophagus. Tissier³ likewise agrees with Lebert and Behier that the frequency is great, and adduced, as an example, his case previously described in this paper; and, finally, Parmentier⁴ had a case of cylindrical-celled cancer of the œsophagus in which there were both old and recent tuberculosis. In Michaux's case only is a microscopical examination of the tubercular condition mentioned, and this was not complete, but most of the cases had fairly complete macroscopic evidence of their nature. Opposed to these cases are the statistics published by Petri,⁵ who found tuberculosis in but four out of twenty-four cases of carcinoma. Lubarsch's⁶ statistics are much more favorable to the French view, including forty-seven cases of cancer of the œsophagus, of which eleven showed lesions of tuberculosis as well. When it is considered, however, that he insists, and justly so, that all tubercular lesions, wherever situated, must be included, and not alone those of the lungs, as many had previously done in considering this question, it must be admitted that even this percentage of 23.4 would indicate rather its rarity than the opposite.

Hence, as far as statistics may be followed, there seems no causal relation on this point, though Peter's suggestion of the provocation of tuberculosis by the insufficiency of nourishment is certainly one that must have a positive bearing upon the question, and, in our case, the tuberculosis seems to have been regenerated in this way.

In the wider question of the relation of the two diseases in general, the original dictum of Rokitansky has disappeared from the argument, and the greater tendency now is to a magnification of the rôle of local tuberculosis in the causation of cancer. Ribbert⁷ takes the most extreme

¹ Michaux: *Ibid.*, 1879, liv.

² Porchaire: *Tuberculose consécutive au rétrécissement cancéreux de l'œsophage*. Thèse, Paris, 1883.

³ Tissier: *Annales des maladies des l'oreille, du larynx, du nez et du pharynx*, Nov. 1887.

⁴ Parmentier: *Archiv. général de méd.*, 1889, i. p. 470.

⁵ Petri: *Krebs d. Spaiseröhre*. Diss., Berlin, 1868.

⁶ Lubarsch: *Virchow's Archiv*, Bd. cxi. S. 280.

⁷ Ribbert: *Münch. med. Wochens.*, 1894, n. 17.

view on this point, and would make the causal relation a very intimate one. He holds, first, that the origin of cancer is due to the early proliferation of the connective tissue and its growth into the epithelial layers, finally cutting off portions of the epithelial cells, rather than to the primary growth of the epithelium itself. He supports this with the statement that Koster told him he had frequently found tuberculosis in malignant tumors of the chin, lower lip, and breast (but that they had never been carefully examined owing to the carelessness of an assistant), and with the description of eleven cases which he had examined, which showed typical cancer alveolæ in a tissue much infiltrated with round-cells and containing many or fewer giant-cells in the different cases. While the round-cells were occasionally collected into tubercle-like aggregations, in some cases they were not. In two of the cases the cancerous infiltration was but slight, while the tuberculosis—if such—was already well advanced. The descriptions are, however, solely of the local condition and are by no means convincing of the existence of tuberculosis there, and bacilli were not found in any case. As Clement¹ points out, the condition would strongly suggest a “foreign-body tuberculosis.”

The more general view is to consider a local tuberculosis as predisposing to cancer in the same way that other sources of chronic irritation are known to do this, as the frequent pipe-smoker's cancer of the lip and the scrotal cancer of the chimney-sweep, or, more to the point, those that occur on the site of the chronic leg ulcers. Cordua and Zenker, as mentioned, have reported cases of the two combined in œsophageal ulcerations, in which as in Lubarsch's² case, occurring in the ileum, and in Baumgarten's,³ of the rectum, the tuberculosis was apparently secondary to the carcinoma, and Clement⁴ noted the frequency of tuberculosis in certain parts—especially certain lymphatic glands, as in the axilla—when carcinoma existed near by, while these same structures are usually rarely affected. But Crone⁵ and Baumgarten⁶ have reported quite typical chronic tuberculosis of the larynx with secondary carcinoma in the same tissue, and Hildebrand⁷ a case of primary sarcoma of the lung and one of primary carcinoma of the same organ, in both of which the growths were situated near tubercular lesions, and, he thought, probably caused by them.

It is in lupus vulgaris, however, that this combination has been most

¹ Clement : Virchow's Archiv, Bd. 139

² Lubarsch : loc. cit.

³ Baumgarten : Centralbl. f. Bacteriologie u. Parasitenkunde, 1894, xv.

⁴ Clement : loc. cit.

⁵ Crone : Centralbl. f. Bacteriologie u. Parasitenheilkunde, 1894, xv. p. 377.

⁶ Baumgarten : Arbeiten aus dem Pathologisch-Institut zu Tübingen, Bd. ii. Heft 1.

⁷ Hildebrand : Zwei fälle v. primär malignen lungentumoren im anschluss an lungentuberculose. Inaug. Diss., Marburg, 1887.

frequently met with, and many men would make lupus a much more specific cause of cancer than the simple forms of inflammation, because of the peculiar form of interpapillary growths of the epithelium which may extend well into the subjacent tissues, even as far as the bone, according to Busch, and may show great numbers of pearly bodies, while the clinical cause remains entirely non-malignant. It is only when the ingrowths lose their limiting-membrane and form atypical nests that malignancy is developed, and this even does not seem always to determine the nature of the disease, so that Bayha¹ would make the diagnosis in these intermediate cases depend more upon the clinical course than upon their histological character. He quotes cases described by Lang and Kaposi as similar to one of his own, and gives an interesting description of the latter; those portions of the tissues which were not cancerous, but in the immediate neighborhood of the cancer, showed most prominently an extreme change of the papillæ. They were markedly enlarged, partly long and narrow, like intestinal villi, partly broad and rounded. There was much round-cell infiltration, and here and there clusters of these cells which were often divided off from their surroundings by spindle-cells. The corium was much thickened and in the deeper parts the diffuse infiltration ended, and there were here many small masses of round-cells of irregular shape, and these especially accompanied the vessels. The epithelium showed great atypical growth, the cells in the heavy layer being particularly so much increased that they filled nearly all the spaces between the overgrown papillæ, and, as these latter often touched at their ends, there appeared isolated epithelial masses. Some small, sharply bounded epithelial prolongations reached deeply into the parts of the corium, showing the lupus-infiltration. There was a great tendency everywhere to form pearly bodies.

In the cancerous parts there was a suggestion in spots only of typical epithelium. There were many typical cancer-nests and prolongations both in the superficial and deep parts, the remaining tissue being infiltrated diffusely with round-cells and tubercles, and in places he found, he thought, evidence of the direct replacement of the tubercles by cancer-nests; in some parts he saw a few epithelial cells scattered through a tubercle; again, a typical nest forming in the centre of a tubercle; elsewhere masses of round-cells, cancer-cells, and granular débris from cell-destruction. Extending to these collections were prolongations from cancerous nests. This description is very like some of the appearances seen in the sections from our case, in the portions that are cancerous, the epithelial prolongations communicating with aggregations of epithelial cells—sometimes but few in number, often a small nest, and, again, quite well-formed, large alveolæ, and often in these

¹ Bayha: Beiträge zur klin. Chir., Bd. iii. Heft 1.

nests shapeless material that looks like degenerated cells; and these epithelial cells, in whatever form, are frequently surrounded by an especially thick collection of round-cells, often appearing much like a well-limited original tubercle. It is difficult to convince one's self, however, that this appearance is not caused by the irritation of the newly forming cancer-nests rather than by pre-existing tubercles which are succumbing to the advancing malignant disease.

Bidault¹ held, however, much the same view, maintaining that cancer may arise from lupus-scars or from a florid and advancing case; and Raymond² followed him, collecting fourteen cases, three of which were his own, in which cancer arose from a florid lupus; while Nithak³ compiled thirty-two cases arising from the active disease. These figures are, however, much damaged by the claim of many others and Bidault's own admission that there exists some scar-tissue in any case of lupus, and from this might arise a cancer that seemed to appear on the basis of actively inflamed tissue. There seems, in consideration of the vast number of cases of lupus that have been under careful observers without mention of malignancy, no reasonable ground for believing that even lupus, the most favored subject for this contention, causes any especial tendency of its own to cancer. It certainly does act as the starting-point of malignant growth, but all published knowledge would tend toward keeping it in the general class of chronic irritants.

Lubarsch⁴ has recently investigated the statistics of the general question of the lesions of the two diseases in the same individual, and again considers those of Cohen, who found but one combination in fifty cases of phthisis and thirty of cancer; Sandu-Miclesco, whose figures reached but 9 per cent.; Rapok, with thirty-nine tubercular in 399 cancerous; and others, who did not include tubercular lesions existing anywhere, were incorrect. He collected 569 cases of cancer, and investigating on this basis he found 117 tubercular—*i. e.*, 20.6 per cent. This makes his figures again look large; but he himself contradicts this by further stating that in his records there were 3.7 per cent. more tubercular who were non-cancerous than among those who were cancerous; and, on the other hand, 1.05 per cent. more cancerous among those who were not tubercular than among those showing lesions of tuberculosis. There is thus evidence that the two diatheses are unfavorable, each to the other, though the degree is slight and does not by any means amount to the original idea of Rokitansky of an antagonism. Lubarsch adduces figures and examples to prove that age is not the factor responsible for

¹ Bidault: Du lupus compliqué de l'épithéliom. Thèse, Lille.

² Raymond: Annal. du dermatol., Bd. viii. Heft 3.

³ Nithak: Beiträge z. Lehre vom Carcinom. Dissert., Marburg, 1887.

⁴ Lubarsch: Ergebnisse der allgemein. Pathologischen morphologie und Physiologie, 1895, p. 466.

this, and suggests that more intimate study of the blood may make clearer the relations the diseases bear to each other. He makes a very lucid classification of their combinations, as follows:

CLASS I.—The tuberculosis is healed and the cancer has appeared subsequently. This is purely chance, and there is no actual relation.

CLASS II.—There are both old and recent tubercular lesions. Here the cancerous cachexia has probably produced a favorable soil for the tubercle-bacilli that have remained from the former struggle.

CLASS III.—To a cancer in active progress fresh tubercular lesions are added. This is but a rare and unimportant condition.

CLASS IV.—Cancer and tuberculosis proceed simultaneously. This is also very rare, and he considers the tuberculosis in such cases as predisposing to cancer by lessening the physiological resisting-powers.

Our case is difficult to place in this classification, however, and is excluded by the existence of the tuberculosis of the œsophagus in addition to his pulmonary lesions. The ancient tuberculosis, of course, played no active part in the etiology of the cancer; while the recent tubercular lesions almost certainly existed in part for many months previously to his death, while the carcinoma was of later origin. The pathological history would seem to be a local tuberculosis of the œsophagus, from the chronic irritation of which arose the cancer, and in this latter the added lowering of his resistance by the pulmonary tuberculosis lent its aid.