Service personnel between the ages of 18 and 30 (Davies *et al.*, 1951, unpublished results). Figures have been obtained from 230 males from the armed Services.

The mean value of the ChE No. was 111. (The coefficient of variation of this series was 12.1.) Thus the normal limits—that is, the fiducial limits—become 87 and 136. Owing to the difference between the red-cell activity of the Service and civilian groups (Callaway *et al.*, 1951), these values are probably too high by about 5 to 7%, and accordingly a sounder estimate of the lower limit may be taken as 80.

No observations have been made upon the "personal" variation of the ChE No. The relevant data of Callaway *et al.* (1951) may, however, be used to provide an estimate of what must be the difference between two determinations in the same person of the cell (or plasma) enzyme which will indicate departure from normal limits. The differences referred to above for the red-cell and plasma enzyme respectively are 15 and 20% of the higher of the two values. Thus even if the plasma figures were applied to the ChE No.—that is, even if the wider limits were applicable—there still remains a substantial margin between the recognition of abnormal deviation and the onset of those symptoms which indicate the development of lethal processes. The ChE No. must certainly be decreased to below 40% of its initial value before any definite clinical symptoms due to systemic absorption occur (Davies, 1951, unpublished results).

Normal limits for the whole-blood, red-cell, and plasma enzyme are summarized in the Table.

	Cholinesterase Number	
	Lower Limit	Upper Limit
Red blood cells	51	100
Plasma	40	100
Whole blood	80	129

Variations in Blood Cholinesterase Due to Disease

There are many references in the literature to the variation of both cell and serum cholinesterase. Most of the information, however, has not been really substantiated, and in only two conditions is there clear-cut evidence correlating a lowered cholinesterase with the disease. Thus the position has been accurately summed up by Augustinsson (1948) in these words: "The cholinesterase concentration of the blood has been widely studied in order to correlate the enzyme activity with various pathological conditions. . . . The mass of data obtained, however, has not allowed of any conclusions as to the relation between ChE activity and the disease investigated."

Reduced serum cholinesterase values have been found in liver disease by a number of workers (McArdle, 1940). Hutchinson *et al.* (1951) have recently shown that the plasma enzyme is very significantly lowered in malnutrition. There is little firm evidence to indicate any great variation during disease in the amount of cholinesterase in red cells.

Summary

The suitability or otherwise of the various common methods for the routine estimation of cholinesterase is described.

It is suggested that the "cholinesterase number" (ChE No.) should be determined as a routine screening test, using the Michel electrometric method for the purpose, and that any departures from normality should be investigated in a more orthodox manner by determinations of red-cell and plasma cholinesterase, also using the electrometric method.

Details of techniques for obtaining blood samples and a description of the reagents, apparatus, and methods of performing the enzyme analysis are given.

The problem of normal values of the ChE No., together with the population and personal variation of both enzymes, is discussed. Values of normal limits are included.

In only two pathological conditions—liver disease and malnutrition—is there firm evidence that the level of serum or plasma cholinesterase is lowered. There is no clear-cut evidence that the level of the red-cell enzyme is seriously influenced by disease.

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CARCINOMA OF THE OESOPHAGUS

THE DIAGNOSIS AND SURGICAL TREATMENT OF 159 CASES

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This paper presents the clinical aspects and pathology of 159 patients suffering from carcinoma of the oesophagus who were admitted to Hammersmith Hospital during the past nine years. We have reviewed the surgical results during the period 1946–9 inclusive. The late Professor Grey Turner, who played such a great part in laying the foundation of oesophageal surgery, was in charge of the cases before 1946, and since then one of us (R. H. F.) has continued with the management of this condition.

Major discoveries and minor modifications during the past few years have resulted in a steady improvement in the surgical results, and attention is drawn to those adjuncts that have been of particular help.

Clinical Aspects

Age and Sex.—Of the 159 patients, 72% were men and 28% women. The average age of the men was 63 years and of the women 64. The youngest patient was a man, aged 22, with a resectable growth of the upper third of the oesophagus. The oldest patient was a woman, aged 81, with an inoperable growth situated in the middle third of the

oesophagus. The oldest patient upon whom a successful resection was performed was 76 at the time of the operation. The age group most affected was that between 60 and 70 years, and comprised 34% of the patients. The age group next in frequency of involvement was that between 70 and 80, and comprised 31% of the patients.

Duration of Symptoms Before Admission.—Sixty per cent. of the patients were aware of symptoms for three months or less before admission. One patient, who had suffered for two years from dysphagia, died six days after admission and a necropsy showed an extensive growth ulcerating through the trachea. Six patients stated that symptoms relating to their condition had been present for over one year.

Site of Growth.—Sixty per cent. of the patients had growths situated in the lower third of the oesophagus, 28% in the middle third, and 12% in the upper third.

Earliest Symptoms.—Dysphagia is the commonest first symptom of the disease (see Table I). This symptom was

TABLE I.—*Earliest Symptom Observed by Patient in 159 Cases of Carcinoma of the Oesophagus*

Symptom	No. of Patients	Symptom	No. of Patients
Dysphagia	137	Hiccup	3
Epigastric pain ..	6	Lump in throat ..	2
Upper abdominal pain ..	2	Loss of weight ..	1
Substernal pain ..	3	Anorexia	1
Back pain	1	Lump in femur ..	1
Pain in the neck ..	1	Haematemesis ..	1
Weakness	4	Irritation in throat ..	1
Regurgitation	3		

noticed first by 87% of the patients. Pain occurred in various sites, including the epigastrium, upper abdomen, behind the sternum, in the back, and in the neck. Weakness was noted by four patients as the initial symptom, hiccup occurred in three patients, and regurgitation of recently swallowed food was experienced by three other patients. Other rare presentations are described more fully below.

Physical Signs.—Loss of weight is the most constant finding on clinical examination. Examination of the neck may show the presence of malignant nodes. These were palpable in six patients, though in two of them the growth was situated in the thoracic part of the oesophagus, as subsequent biopsy confirmed. Evidence of intra-abdominal spread in the form of a palpable or nodular liver was present in 12 cases.

Symptoms in Detail

The symptoms shown in Table II have been chosen for more detailed consideration; most of the patients had a triad of symptoms—dysphagia, regurgitation, and loss of weight.

TABLE II.—*Symptoms Complained of During the Course of the Disease*

Symptom	No. of Patients	Symptom	No. of Patients
Dysphagia	153	Anorexia	14
Loss of weight ..	145	Heightened appetite ..	14
Regurgitation ..	104	Cough	23
Pain	66	Flatulence	22
Sense of obstruction ..	76	Haematemesis ..	17
Weakness	26	Melaena	5
Constipation	31	Excessive salivation ..	2

* Anorexia was commonly complained of in the case of growths affecting the lower part of the oesophagus, but was not a common feature of upper oesophageal growths.

It was found that 76 patients were aware of an obstruction, and 55 of them gave the correct level of the growth. In 38 out of 66 (53%) patients suffering pain it was situated over the site of the growth.

Involvement of the mediastinal structures may produce pain in the back, but this may occur even from a growth which has not spread beyond the oesophagus; in only 3 out of 16 patients who suffered from pain in that site had the tumour infiltrated beyond the wall of the oesophagus. Back pain should not therefore be considered a contra-indication to operation.

Flatulence may vary in its effect. In 20 patients it relieved or did not cause pain; in two, pain was occasioned by it.

Unusual Presentations

Summaries of the rare presentations of the disease in this series are given.

A woman aged 71 attended another hospital complaining of pain in the left leg and a swelling in the left groin. A biopsy was taken, and the swelling was diagnosed histologically as a fibrosarcoma. The condition was then treated by removing the limb. During the succeeding months masses developed in the groins, neck, and chest. Further examination of the biopsy specimen was then made, and the original diagnosis was discounted in favour of an anaplastic carcinomatous deposit. The primary was not found until after death; it was situated in the mid-thoracic part of the oesophagus. The patient never complained of dysphagia, although scrutiny of her notes revealed that on one occasion she had regurgitated blood-stained material.

A man aged 45 attended another hospital complaining of soreness of his throat. Tonsillectomy was carried out. Dysphagia developed after the operation and pain was experienced at the back of the head and over the left ear. Further investigation then revealed a growth situated in the upper third of the oesophagus.

A woman aged 81 was admitted complaining of colicky lower abdominal pain and constipation for several weeks. Investigations, confirmed by laparotomy, revealed diverticulitis of the colon, and the finding was considered to be an adequate explanation of the symptoms. However, she complained of pain in the left thigh, and an x-ray film showed Paget's disease. The patient was discharged, but was readmitted a month later because of pain in the back, in the lower thoracic region; she appeared to be quite ill. Clinical examination now revealed the presence of a swelling in the left femur and enlarged inguinal lymph nodes. A second x-ray film disclosed bony destruction occurring in the region of the great trochanter, and a biopsy of one of the lymph nodes showed carcinomatous deposits. The patient's condition continued to deteriorate, and shortly afterwards she died. At necropsy a primary carcinoma of the oesophagus was found, with secondaries in the inguinal lymph nodes and malignant deposits in the femur.

One man was regarded initially as suffering from angioneurotic oedema of the throat. His symptoms were swelling and irritation of the throat. On examination an oedematous uvula was found. The symptoms improved with the use of antihistamine drugs. He subsequently developed dysphagia and vomited blood-stained material, after which a malignant oesophageal growth was proved.

A woman of 63 was admitted as a case of attempted suicide. Dysphagia and increasing fatigue were the causes of the depression, which led to her attempt on her own life. Investigations and a thoracotomy performed at a later stage revealed an inoperable growth of the oesophagus.

A man aged 58 was admitted with a catastrophic haematemesis and rectal bleeding. He died despite rapid blood transfusion. Necropsy revealed an extensive growth of the oesophagus ulcerating through the aorta.

A man aged 68 was admitted to another part of the hospital with a swelling of the right alveolus. An enlargement of the liver was found on examination. Several biopsies were taken, and the histological diagnosis made was adamantinoma. However, his general condition deteriorated rapidly and an alternative diagnosis was made of primary carcinoma of the liver. Deep x-ray therapy was begun, but the patient died. At necropsy a primary carcinoma of the oesophagus was found, with secondaries in the liver; the jaw condition was a secondary deposit.

A man aged 71 complained of regurgitation of food for several months and loss of weight. He was admitted to another hospital and investigated by a barium swallow, in addition to the usual routine examination, and was finally

discharged because nothing was found. Several months later he was admitted to this hospital and died soon after admission. The necropsy revealed a malignant growth involving the upper thoracic part of the oesophagus.

We may mention here one patient who was sent to us as suffering from carcinoma of the oesophagus, but who had in fact a primary carcinoma elsewhere. She was a woman, aged 63, who complained of a varying but progressive dysphagia for two months and a loss of weight over the preceding year. On examination hard enlarged glands were palpated on both sides of the neck, and further examination revealed a carcinoma of the right breast. A barium swallow showed a narrowing of the middle third of the oesophagus, but the mucosa appeared intact. Oesophagoscopy confirmed that the narrowing was due to pressure from without. This mechanical compression was in fact caused by malignant mediastinal lymph nodes resulting from the carcinoma of the breast.

Special Investigations

The following examinations were carried out on every patient.

1. *Barium Swallow and Chest X-ray Examination.*—The direct approach to the diagnosis of malignant tumours of the oesophagus is by barium swallow, yet complete reliance must not be placed on it, for it is occasionally inaccurate. In seven patients barium swallow did not reveal the exact diagnosis. Of four overlooked in this hospital, two were regarded as suffering from achalasia. If a lesion is clinically suspect and the barium swallow does not reveal the presence of a growth, oesophagoscopy must be carried out; our last successful resection undertaken was on a woman aged 42, whose barium swallow was reported by the radiologist to be normal, yet oesophagoscopy subsequently performed showed a malignant ulcer, and later, at operation, a growth was seen to extend for 3 in. (7.5 cm.) along the lower third of the oesophagus without causing an appreciable narrowing of the lumen. On routine examination of the chest a secondary deposit is occasionally found in the pulmonary field. In one case a lateral view of the oesophagus showed absorption of the front parts of the bodies of the lower thoracic vertebrae. The use of thicker barium mixtures may outline tumours whose appearance is only doubtfully outlined by the standard swallow, or not at all.

2. *Oesophagoscopy.*—This essential procedure is employed in all cases, and if a growth is discovered a biopsy is performed. No carcinoma of the oesophagus has been missed when it has been employed, and there have been no accidental perforations of the oesophagus.

3. *Examination of Stools for Occult Blood.*—Although an examination of the stools for blood is always carried out, a positive result was obtained in only 18 patients. No reliance should be placed on a negative result.

4. *Examination of the Blood.*—Haemoglobin estimations are made repeatedly so that anaemia may be treated by oral iron or transfusion, according to its degree. We try to avoid a transfusion immediately before the operation. A full blood picture is requested if there are specific indications for it—the presence of enlarged lymph nodes, for example. The level of the plasma proteins is recorded.

5. *Heart and Kidney Functions.*—An electrocardiogram, a blood urea estimation, and a kidney-function test are occasionally requested to corroborate the clinical appraisal of the functions of the heart and kidneys.

6. *Indirect Laryngoscopy, Bronchoscopy, and Sputum Examination.*—These tests are performed if indications are present. The presence of a cough with the production of large quantities of purulent sputum is strongly suggestive of involvement of the lung and possibly the presence of a fistula.

Pre-operative Management

Patients present complaining of varying degrees of dysphagia. A patient allowed to take solid food soon produces a complete dysphagia by occluding the remaining

part of the lumen of the oesophagus. Solid food is accordingly withheld and the patient is given hourly feeds of fortified milk, 1 pint (570 ml.) of which contains 1 oz. (28 g.) of calcium caseinate and 1 oz. (28 g.) of glucose, lactose, or sucrose.

On this diet the patient steadily increases in weight and becomes fit enough for operation. If the patient is unable to take fluids and becomes severely ill, a blind jejunostomy or gastrostomy is performed under local analgesia. On the other hand, if the patient is well enough, opportunity is taken at the time of operation to explore the abdomen. Physiotherapists attend daily and teach the patients to expand and clear their chests in order to obtain the maximum respiratory capacity and function. Penicillin is given for 48 hours before and after the operation to lessen the incidence of pulmonary infection. When the patient is ready for operation 6 pints (3.4 litres) of blood are cross-matched and held in readiness. A saline drip is begun before the patient is taken to the theatre.

Infected teeth are treated by local cleansing. Wholesale extractions should be avoided.

Treatment

It is impossible to particularize on the respective radical procedures employed for each part of the oesophagus, but the following general principles are customarily followed.

1. Operability

Absolute contraindications to excision are involvement of the air passages or evidence of distant dissemination. In the absence of these, exploration should be undertaken and the operability reassessed at thoracotomy. General debility is no bar to exploration, provided that enough nutrition is afforded before operation by the use of fortified milk. It has been stated elsewhere that growths which cannot be separated by blunt dissection are inoperable, but we have employed sharp dissection where necessary, with frequent success.

2. Operative Procedures

Our main objective in all operations has been the restoration of normal swallowing, and in the radical procedures we hope also that we have given the patients some chance of complete cure, however slight.

Growths at the lower end of the oesophagus which involve the cardia are treated by block dissection of the stomach, together with the spleen, omentum, and tail of the pancreas, through a thoraco-abdominal approach, according to the method so well described by P. R. Allison and J. Borrie. Restoration of continuity is effected by oesophago-jejuno-stomy, employing an undivided loop of small bowel, if possible, or, if that is impossible, by fashioning a Roux anastomosis en-Y.

Carcinomata situated in the lower half of the thoracic oesophagus which did not involve the cardia were exposed through a left abdomino-thoracic approach made at a slightly higher level. If resection was possible, anastomosis was effected by bringing up the stomach, with its vascular arches preserved, and anastomosed to the oesophagus below the aortic arch, provided there was enough healthy oesophagus well clear of the growth below the arch. Although the mortality may be increased by a supra-aortic anastomosis, it is nevertheless better to face it rather than risk an unsatisfactory anastomosis made close up under the arch.

It is not certain which is the best method of treatment for growths in the upper part of the thoracic oesophagus. If the patient is reasonably fit the reconstruction of choice is probably a cervical oesophago-gastric anastomosis, but this operation is of such severity that many patients are unfit to withstand it; in these cases a palliative procedure is indicated.

Palliative Procedures

Inoperability Decided Before Operation.—If the growth is situated in one of the less favourable positions, such as the upper thoracic portion of the oesophagus or at the upper

thoracic outlet, and if in addition the patient is a poor surgical risk, it may be unwise to attempt any radical operation. In these circumstances the introduction of Souttar's tube provides a good form of palliative treatment. The implantation of radon seeds through the oesophagoscope is practised successfully by V. E. Negus as a better form of palliation, but the technical difficulties and the special instruments necessary make this method unsuitable for all but the few. Simple palliation may be justified in certain cases, and, if combined with the swallowing of hydrogen peroxide solution, may enable the swallowing of soft foods to be resumed, but this method is not free from the danger of perforation of the gullet.

Inoperability Decided At Operation.—If an extensive surgical approach has been made and the condition is then found to be inoperable, every attempt should be made to carry out some palliative procedure which will enable the patient to regain the power of swallowing. For growths at the cardia, the best method of achieving this is by constructing a Roux loop en-Y and anastomosing it to the oesophagus, which is divided above the growth. For growths higher up in the thoracic oesophagus the best form of palliative short-circuit is to make use of the stomach. The whole of the stomach is mobilized and also that part of the oesophagus which lies below the level of the growth. The oesophagus is now divided above the growth, the lower end securely closed, and the upper cut end anastomosed to the fundus of the stomach, which, if necessary, can be brought above the arch of the aorta.

Post-operative Management

The patient is returned from the theatre with a drainage-tube connected to an under-water seal, and the tube is usually removed after four or five days. During the extraction of the tube care is exercised to prevent the entry of air into the chest. A daily examination of the patient's chest is carried out and a routine x-ray film is taken on the first, third, and seventh days. Aspiration of the chest is performed at the upper limit of the area of dullness elicited on percussion if the patient's respiration becomes embarrassed, or if more than one-third of the pleural cavity is seen to be occupied by fluid.

Resuscitation is aided in the immediate post-operative period by raising the end of the bed on blocks, placing the patient in an oxygen tent, and giving transfusions of blood, saline, or 5% dextrose as required. The drip is discontinued after 48 hours, and we find the patients can be sufficiently hydrated with oral and rectal fluid. Water containing 100,000 units of penicillin in 2 ml. is given in that dose every hour from the 12th to the 48th hour after the operation. On the third day 1 oz. (28 ml.) of half-strength saline or weak tea is allowed hourly, and on the fourth day 2 oz. (57 ml.) of this saline or citrated milk or tea is given hourly. Milk puddings, mashed potatoes and gravy, coddled egg, and thin bread-and-butter may be started on the sixth day.

The patients are usually undernourished and have little subcutaneous tissue, so that care must be taken to avoid the occurrence of bedsores. Careful supervision of the water seal is essential in order to prevent air entering the chest.

A careful watch is made every day, before and after operation, for the presence of thrombosis in the veins of the lower extremity.

If leakage occurs at the anastomosis, oral administration of fluids should be stopped, intravenous therapy reinstituted, and the drainage tube left *in situ*. One of our patients developed an ileus, and we were unable to pass a tube through the region of the anastomosis to decompress the intestine; we were eventually compelled to perform a blind jejunostomy for drainage. After decompression the patient fully recovered, swallowing was resumed without difficulty, and the jejunal opening closed spontaneously.

Regurgitation of acid gastric contents may occur after oesophageal operations. This regurgitation is painful and takes place after eating or when the patient lies down. It

can be successfully treated by advising the patient to sleep well propped up, and by prescribing olive oil before meals and magnesium trisilicate after them.

Pathology

Most of the growths were squamous carcinomata (see Table III), nine were adenocarcinomata, and the rest were of the undifferentiated variety. One patient may have

TABLE III.—*Histology of Growth*

Squamous carcinomata	67
Undifferentiated squamous carcinomata or anaplastic growths	16
Adenocarcinomata	9

had two primary growths of the oesophagus. He was a man aged 64 with a six-months history of dysphagia, regurgitation, and weakness. The summary of the pathological report is as follows: "One ulcerating growth was situated in the region of the tracheal bifurcation; histologically it was seen to be a well-differentiated squamous carcinoma. The second lesion had not ulcerated, and was 2 in. (5 cm.) above the cardia. Histologically an anaplastic spheroidal cell growth with no evidence of squamous origin was observed, the cells of which were rather loosely arranged on a firm connective-tissue strand suggesting papillary arrangement. It appeared to be a separate tumour and not a metastasis of a squamous carcinoma."

Two patients had the type of growth which spreads extensively under the mucosa of the oesophagus.

Complications

Pulmonary complications (see Table IV) are still the major problem following the radical operation, although the lungs are inflated during and at the termination of the oper-

TABLE IV.—*Complications Causing Death After Operation*

Causes of Death	No. of Patients
Pulmonary collapse or congestion	7
Pulmonary infarction	1
Leakage of anastomosis	2
Peritonitis	1
Internal strangulation	1
Cerebral arteriosclerosis	1
Unknown	1

ation. The use of sulphonamides and antibiotics has decreased the incidence of these complications but has not abolished them.

Early in 1947 a fatal herniation occurred through the diaphragm alongside the mobilized bowel.

Leakage at the anastomosis has occurred twice in this series, excessive mobilization presumably having imperilled the blood supply.

Results (See Table V)

It is difficult to find in the literature any considerable series of cases of carcinoma of the oesophagus accompanied by the enumerations of long-term survival. The experiences

TABLE V.—*Treatment and Results of the Last 72 Patients*

Treatment	No. of Patients	Lived 1-28 Days	Lived 1-6 Months	Lived 6-24 Months	Living
Resections	29	15	6	3	5
Palliative operations	8	5	—	3	—
Explorations	5	3	1	1	—
Jejunostomy	15	6	7	2	—
Gastrostomy	13	3	5	4	1
No treatment	2	2	—	—	—

of Sweet and Garlock are exceptions to this, and so far as we have been able to ascertain their figures have been unsurpassed.

The longest survival in the present series following resection of the growth is that of a woman aged 57, who has now lived, with no clinical evidence of recurrence, for over

four years. She complained of heartburn after operation, but this was successfully treated by alkalis. She swallows without difficulty and has continued her work as a housewife.

Two patients continue to thrive two years after operation; one of them, a woman, is now 69. Two other patients have survived for over 18 months—both had a carcinoma situated in the middle third of the oesophagus.

Of the 72 cases of carcinoma of the oesophagus at various sites 29 had resections, and in 14 the patient survived longer than a month, giving a mortality rate of 51%. Supra-aortic anastomoses had been performed on 7 of the 15 patients who died within the month. The resectability rate was 40%. Eight palliative operations were performed, and three of these patients lived longer than six months.

Jejunostomy was performed on 15 patients and gastrostomy on 13; 7 of these 28 patients have lived longer than six months. No patient in the total series who was not treated by radical operation has lived longer than two years.

Summary

An analysis of the various clinical features observed in 159 patients suffering from carcinoma of the oesophagus has been made. Cases of carcinoma arising in the stomach and involving the oesophagus have been excluded.

Of the investigations, oesophagoscopy is the more exact method of obtaining correct information about the presence or absence of a growth in the gullet. Repetition of a barium swallow may at times be necessary to avoid missing the presence of a small growth.

The use of concentrated liquid food facilitates the preparation of the patient to withstand the severe radical or less severe palliative procedures. With radical treatment, although the mortality is high (50% approximately), the patient may be returned to a normal state with the ability to swallow restored.

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The Hungarian News and Information Service in London, the official mouthpiece of the Hungarian Government, has lately issued several announcements on medicine and science in that country. On March 15, 83 Kossuth Awards were presented at a ceremony in the House of Parliament at Budapest. Kossuth was the leader of the 1848 Hungarian revolution, and these national awards were instituted on the centenary of its outbreak, and are since given annually for outstanding work in the arts, sciences, industry, and agriculture. In the medical section this year Professor György Ivanovits received 10,000 forints for the isolation of vitamin B₁₂, Professor Ferenc Kiss a similar sum for research on the vegetative nervous system and the lymphatics, and Professor Imre Tőro 20,000 forints for the discovery of a new mechanism of cell division. According to a report by the secretary-general of the Academy of Sciences there will be 25 scientific congresses in Hungary during the year, to which 200 foreign guests will be invited. In May there will be a medical congress on the work of Sándor Korányi (1866–1944), a specialist on traumatic diseases. A new Hungarian Biological Association was founded on March 30 at a meeting at the Academy of Sciences. Professor Sándor Jávorka, who received a 1952 Kossuth prize for his studies on the Hungarian flora, was chosen as president, and István Boros, director of the National Science Museum, as secretary.

CANCER OF THE HYPOPHARYNX AND ITS SURGICAL TREATMENT

BY

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Cancer in any part of the pharynx is a serious disease, for it causes severe suffering and is attended by a high mortality. In the hypopharynx these effects are maximal because of gross interference with respiration and deglutition, and the number of patients who have been cured is small. Thus any form of treatment that will relieve the patient's suffering, and is also designed to effect a cure, is welcomed. Contemplation of the serious plight of patients with this disease stimulated me several years ago to study the surgical problems involved in the radical extirpation of the hypopharynx and its lymphatic drainage, and I studied the work of Trotter (1929, 1932), Colledge (1940–3), and Wookey (1948) with profit. In addition, by the clinical examination of patients and a study of pathological specimens and necropsy reports, I sought a better understanding of the behaviour of the disease.

The object of this paper is to present some of my experiences in the treatment by radical surgical operation of a series of 18 patients with cancer of the hypopharynx. Most of them were suffering from advanced disease; some had been pronounced untreatable, were in a sad plight with dyspnoea, stridor, or dysphagia, and had been sent home to await their end. Others had received radiotherapy, but the disease was extending. One patient had had a tracheotomy, with severe dermatitis of the skin of the neck and anterior chest wall; another patient had had a gastrostomy. Their ages varied from 38 to 75, and many were in a very poor general condition.

Classification and Spread of the Disease

Trotter delineated the following areas as the origin of the disease: the epiglottis, glosso-epiglottic fold, aryepiglottic fold, pyriform fossa, posterior wall, and the post-cricoid region. In many patients I was unable to determine the site of origin owing to the large area of the hypopharynx which was involved, even from the pharyngo-oesophageal junction to the oropharynx. In some patients the disease is of multicentric origin, and malignant foci are present in several parts of the hypopharynx and larynx. The growth possesses a high degree of malignancy and is usually a squamous-cell ulcerating lesion. From its origin the disease spreads as shown in Table I.

TABLE I.—Cancer of the Hypopharynx: Methods of Spread

Direct extension	Pharynx, oesophagus, pharyngo-laryngeal septum, larynx, trachea, thyroid gland, internal jugular vein, pre-vertebral fascia, cervical vertebrae, skin.
Lymphatic metastases	Deep cervical, para-oesophageal, and superior mediastinal lymph nodes.
Haematogenous metastases ..	Lungs, liver.

When the growth is localized to one-half of the hypopharynx the deep cervical lymph nodes on the same side are often involved, but those on the opposite side may also be affected. If the growth passes across the midline the lymph nodes on both sides may be the site of metastases. Consequently in every patient I advise a block dissection of the