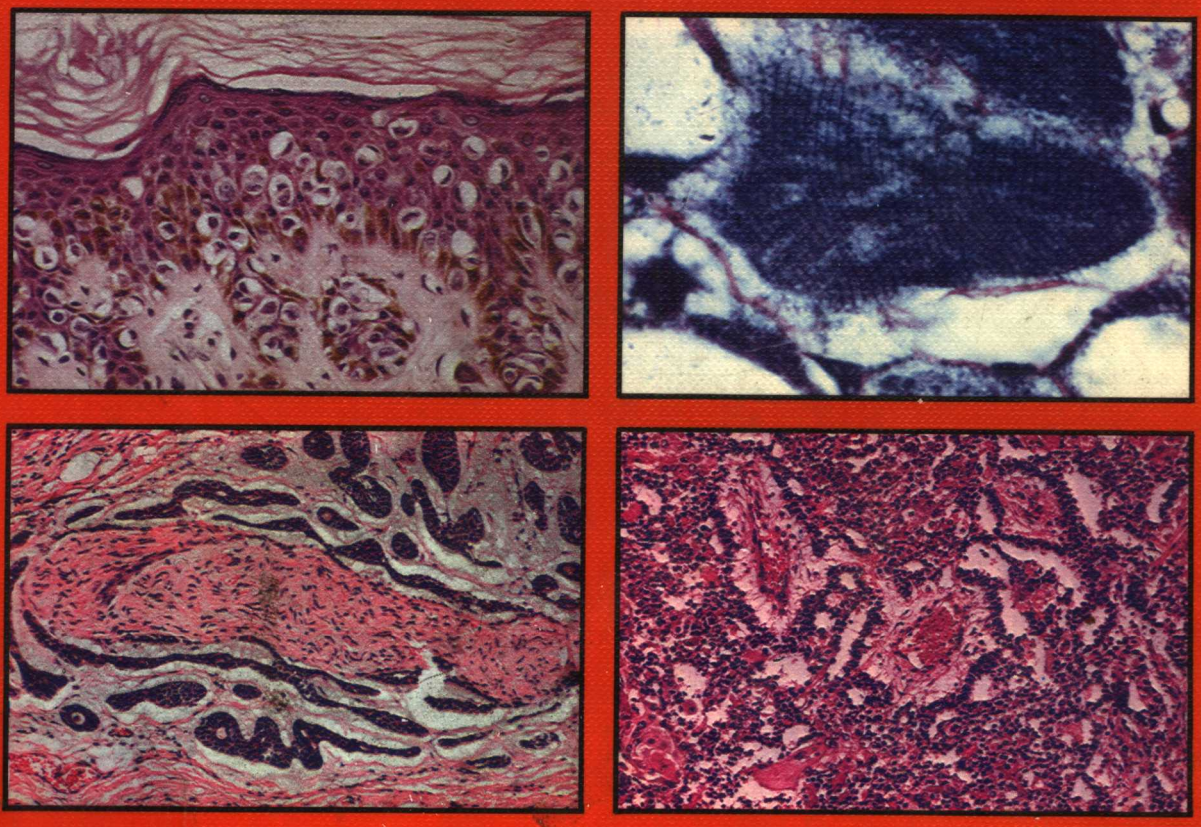
A Colour Atlas of Tumour Histopathology

N.F.C. Gowing



A Colour Atlas of Tumour Histopathology

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Preface

This atlas has been planned as an aid for those studying the pathology, especially the microscopic pathology, of human neoplasms. It was not designed as a textbook, and the reader is referred to the many excellent monographs on tumour pathology for more detailed information. The book was compiled with the trainee pathologist particularly in mind, but it is hoped that it will prove useful to senior medical students, and that surgeons, radiotherapists and clinical oncologists will find it of interest in helping to impart colour and substance to the typewritten words of a formal pathology report.

Although, as the title implies, the atlas is concerned mainly with the microscopic appearances of tumours, a few photographs of gross specimens have been included, either to illustrate an uncommon lesion, or because the particular tumour had interesting and significant clinical associations. Some rare types of neoplasm are briefly described in appropriate sections of the text, although specimens were not available for illustration. The majority of tumours are still diagnosed by the examination of haematoxylin and eosin stained sections with the light microscope; consequently the majority of the photographs are of H & E preparations. However, special staining techniques and electron microscopy are often of value in making or confirming a diagnosis, and a number of appropriate examples are included. Apart from the well-established special staining procedures and histochemical methods, the more recently developed (and developing) immunoperoxidase techniques have added a new dimension to histopathology by enabling us to localise hormones, immunoglobulins and other types of protein within tissue sections; a few examples of the use of this technique are shown.

In addition to neoplasms, a number of non-neoplastic proliferative lesions are described and illustrated, particularly those which sometimes produce a 'pseudomalignant' growth pattern.

With regard to terminology, I have tried to follow the standard modern nomenclature currently in use in the English-speaking world, and I have sought to conform with the classification recommended by the World Health Organization in the series of publications on the 'International Histological Classification of Tumours'. Any information concerning the age and sex incidence, the anatomical location and behaviour of tumours is quoted from definitive articles which have been published in major journals over the past two decades.

All the photomicrographs were taken with a Zeiss Ultraphot II camera microscope, using either Kodachrome 2 or Kodachrome 25 film.

Acknowledgements

This atlas could not have been compiled without the courtesy and help of many friends and colleagues who have been most generous in sending me valuable material over the years. I am especially indebted to my wife who tirelessly typed and retyped the manuscript, including the index.

I should like to express my gratitude to those who have permitted me to reproduce photomicrographs of their specimens: Dr J.A.S. Amos, Professor C.L. Berry, Dr I.M. Calder, Dr J.D. Cheetham, Dr R.T. Cooke, Dr P.W. Darby, Professor I.M.P. Dawson, Professor A. Garner, Professor N. Gibbs, Dr Iris M.E. Hamlin, Professor D.A. Heath, Dr Kristin Henry, Dr K.J. Holley, Dr R.J.A. Jakubski, Dr A.L. Levene, Professor D.H. Mackenzie, Dr M. Millard, Dr Rosemary R. Millis, Dr J.P. O'Sullivan, Dr F.J. Paradinas, Dr Ariela Pomerance, Dr I.B. Porteus, Dr N.E. Rankin, all my colleagues at St George's Hospital (London), Dr Daisy Saw, Professor H.A. Sissons, Dr M.O. Skelton, Dr D.C. Taylor, Dr G.E. Thomas and Dr Stephanie M. Wilson. Dr Kristin Henry provided me with the electronmicrograph illustrated in **691**, and Dr F.J. Paradinas with that shown in **694**. The immunoperoxidase preparations were the work of Dr Eadie Heyderman, to whom I am most grateful. Dr J.S. MacDonald, consultant radiologist, kindly permitted me to use the radiograph in **373**. My thanks are also due to Professor A.C. Thackray with whom aspects of the book were discussed.

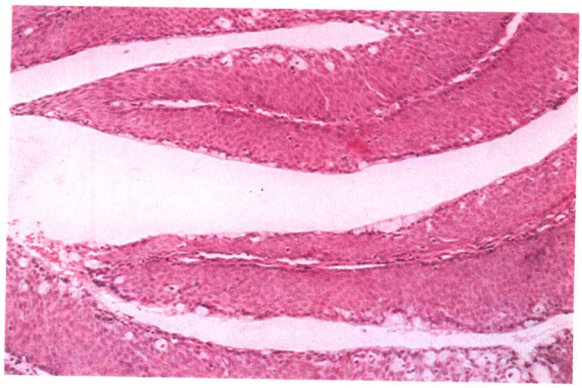
The photographs of gross specimens and the clinical photographs were prepared by the Photographic Department of the Royal Marsden Hospital under the direction of Mr Kenneth Moreman and Mrs Milena Potucek, and I gratefully acknowledge their help.

Needless to say, no photomicrograph can be better than the section from which it is prepared. In this regard, I have been singularly fortunate in having such a skilled and dedicated staff, and I record my deep appreciation to Mr C.G. Chadwin, formerly Chief Technician in the Department of Histopathology at the Royal Marsden Hospital, and to Mrs Diana Mitchell and Mr David Kellock, Senior Medical Laboratory Scientific Officers, and their colleagues, for the many excellent microscopical preparations they have produced.

1. Nasal cavity and paranasal sinuses

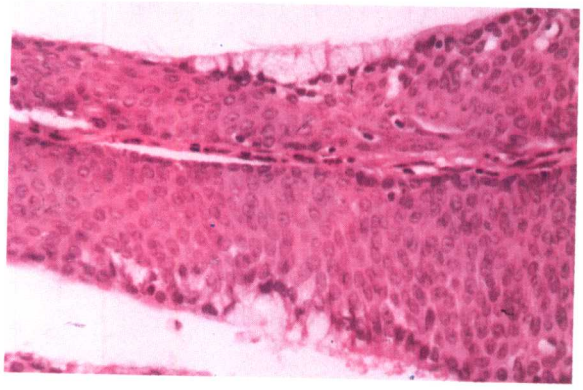
1 Schneiderian papilloma (transitional papilloma) From the maxillary antrum of a 46 year old man. There were multiple recurrences over a 20 year period following the first excision, but at present he is tumour-free. Schneiderian papillomas tend to pursue a course of relentless local recurrence, but they are rarely responsible for death. Carcinoma supervenes in less than 5 per cent of cases. The papilloma illustrated here is composed of branching fronds which have delicate fibro-vascular cores covered by several layers of polyhedral and cuboidal cells. (*H&E* × *90*)

1



2 Schneiderian papilloma Higher magnification of one of the fronds illustrated in **1**. Some of the surface cells are mucin-secreting. (*H&E* × *220*)

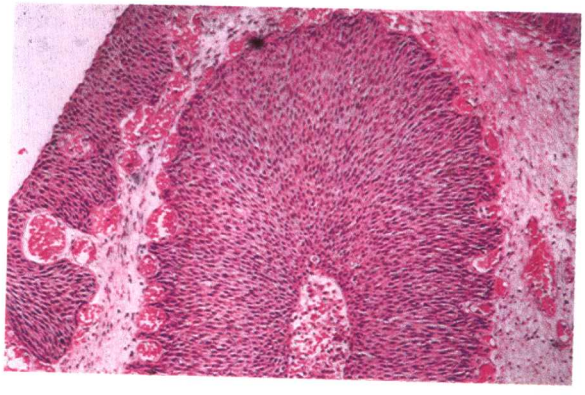
2



3 Schneiderian papilloma A tumour displaying an inverted growth pattern. This does not signify malignancy. Some claim that papillomas with an inverted growth pattern have a higher incidence of recurrence than those displaying an exophytic pattern, but this conclusion is disputed.

Carcinomas of the nasal cavity and paranasal sinuses may show a transitional pattern and are appropriately called transitional carcinomas, but most carcinomas arising in this situation are of squamous-cell type. (*H&E* × *90*)

3



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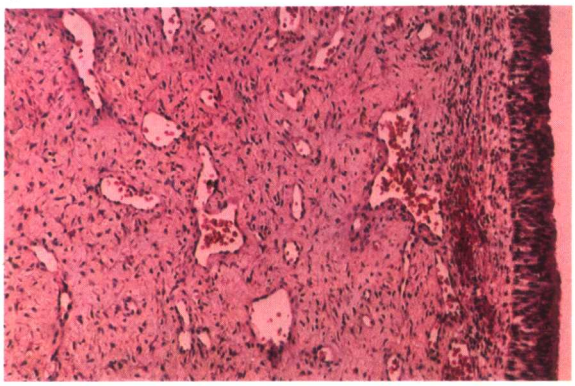
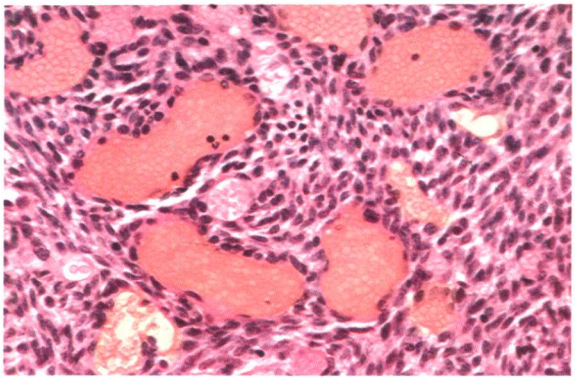


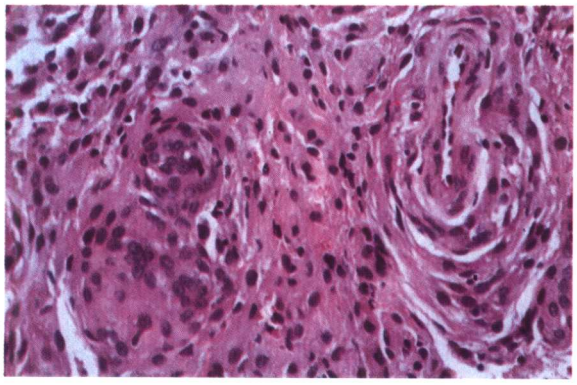
4 Juvenile angiofibroma Section of a polypoid tumour arising from the naso-pharynx of a 14 year old boy. It features regular, spindle-shaped fibroblasts, moderately abundant collagen and numerous blood vessels. These tumours occur predominantly in males. Although they can erode bone by pressure effects, true malignant change is exceedingly rare. (*H&E × 90*)

5



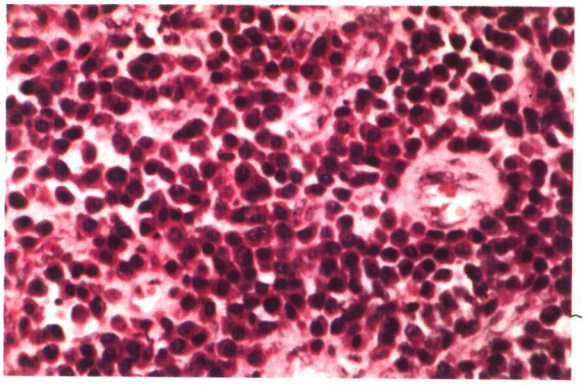
5 Haemangiopericytoma-like intranasal tumour Section of a polypoid intranasal tumour from a 43 year old man. There was local recurrence 2 years after the initial excision. The term 'haemangiopericytoma-like tumour' was suggested in a report of 23 cases studied at a centre in the United States. Although there was some tendency to local recurrence, no metastasis or other form of aggressive behaviour was seen in the series. The neoplasm is composed of a rich plexus of thin-walled blood vessels surrounded by mantles of ovoid and fusiform cells. (*H&E × 220*)

6



6 Meningioma presenting as intranasal tumour From a 37 year old woman. The tumour is of transitional type and displays the characteristic whorled pattern. (*H&E × 220*)

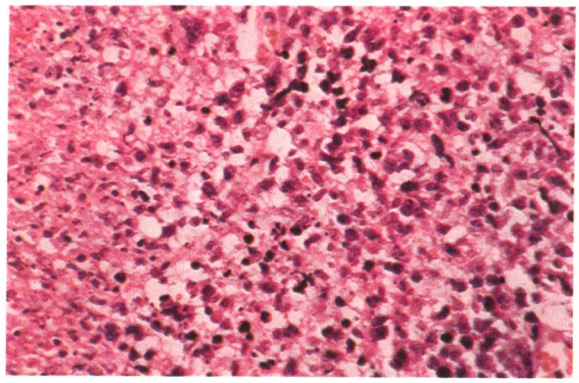
7



7 Plasmacytoma of naso-pharynx Section of a well-differentiated plasmacytoma from a 57 year old man. Note the ovoid shape of many of the cells, the eccentric position of the nuclei, the amphophilic cytoplasm and the clear paranuclear zones (negative Golgi images). (*H&E × 220*)

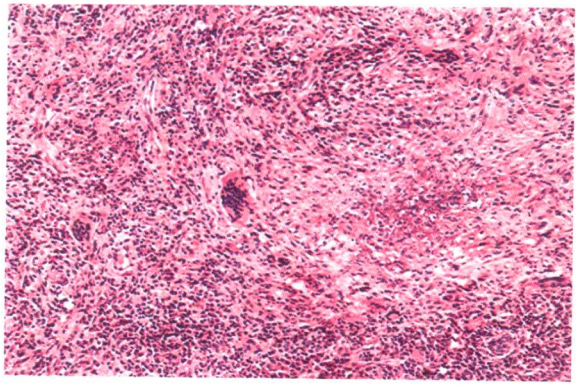
8 Malignant lymphoma of nasal cavity Section of an ulcerated lesion involving the lateral wall of the nasal cavity in a 44 year old woman. Necrotic surface tissue is on the left and pleomorphic lymphoma cells are on the right of the field. Clinically the lesion was thought to be a granuloma. Recent work suggests that the Stewart type of non-healing (midline) granuloma is a malignant lymphoma of histiocytic type. (*H&E* × *220*)

8



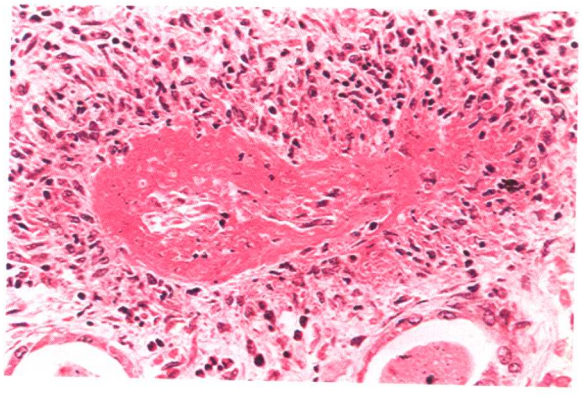
9 Wegener's granuloma Section of an ulcerated lesion involving the nasal septum of a 19 year old man. The patient had constitutional symptoms including anorexia, weight loss, sweating and pyrexia. He died from renal failure within a year. An area of necrosis is surrounded by inflammatory cells, including multinucleated giant cells. (*H&E* × *90*)

9



10 Wegener's granuloma Section of kidney from the same patient as in **9**, showing necrotizing, fibrinoid panarteritis. The vascular changes are similar to those of conventional polyarteritis nodosa, but in Wegener's granulomatosis such vascular lesions are accompanied by granulomas in the upper respiratory tract and lungs, and the kidneys show necrotizing glomerulitis as well as arteritis. Although Wegener's granulomatosis is almost always fatal, immunosuppressive chemotherapy may produce prolonged remissions. (*H&E* × *220*)

10



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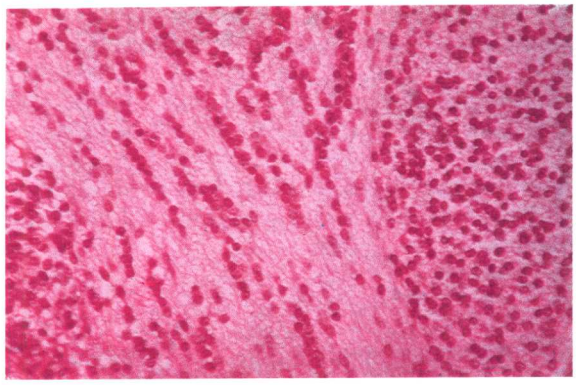
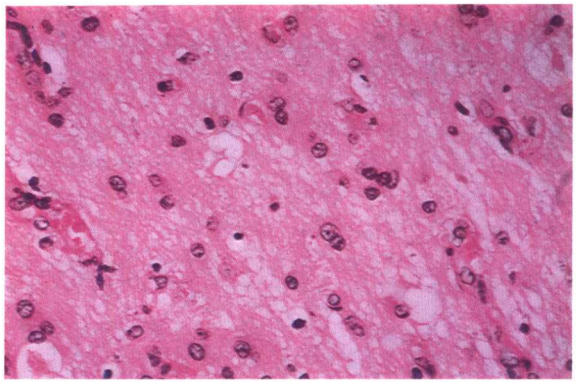


11 Olfactory neuroblastoma (esthesioneuroblastoma) Section of a polypoid intranasal mass from a 20 year old man. The tumour is composed of regular spheroidal cells with delicate fibrillary processes.

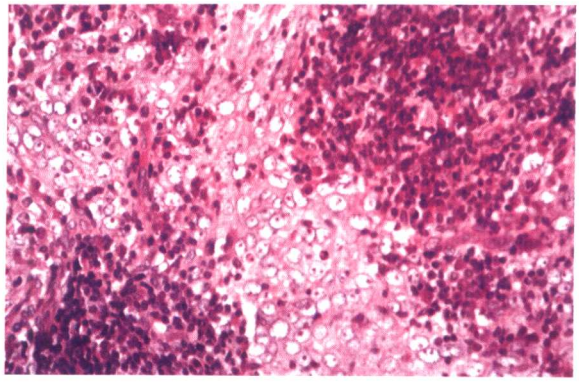
Tumours of this type develop in the region of the olfactory placode. They arise more commonly in males than in females and occur over a wide range of ages, with a peak incidence in the second decade. Olfactory neuroblastomas have a better prognosis than neuroblastomas of other sites, the 5 year survival rate being about 50 per cent. (*H&E* × *220*)

12



12 Nasal 'glioma' From the glabella of a 4 month old boy. No recurrence 10 years after excision. The nodule is composed mainly of astrocytes with abundant eosinophilic fibrils. Such lesions are malformations and heterotopias rather than true tumours. (*H&E* × *220*)

13



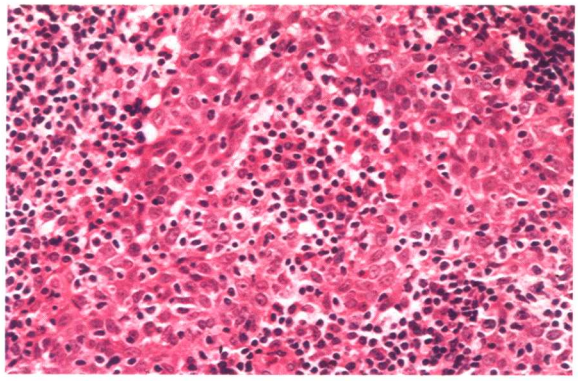
13 Undifferentiated carcinoma of naso-pharynx A tumour from a 25 year old man who presented with enlarged cervical lymph nodes. The primary carcinoma in the naso-pharynx was small and inconspicuous. Note the palely staining epithelial cells with strikingly vesicular nuclei and the surrounding lymphocytes and plasmacytes.

These tumours can occur at any age, children and young adults also being affected. There is a high incidence among Chinese. Enlarged cervical lymph nodes may be the presenting clinical manifestation. (*H&E* × *220*)

14 Undifferentiated carcinoma of naso-pharynx Section showing intimate mingling of carcinoma cells with lymphocytes and plasmacytes ('lympho-epithelioma' pattern).

The term 'lympho-epithelioma' was introduced by Regaud and Schmincke in 1921, but has been largely abandoned. Undifferentiated carcinomas of the naso-pharynx are highly radiosensitive. (*H&E* × *220*)

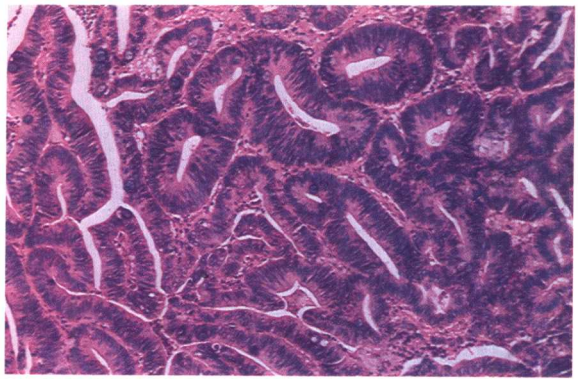
14



15 Adenocarcinoma of nasal cavity From a 65 year old man who complained of nasal obstruction and bleeding. The tumour is composed of columnar cells arranged as well-differentiated tubules; some of the cells are distended with basophilic mucin. The microscopic appearances resemble those of a colonic carcinoma.

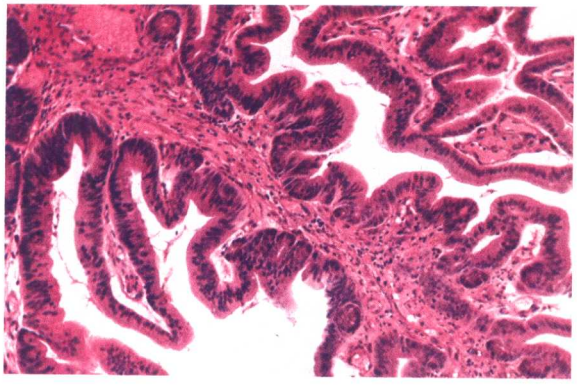
An increased incidence of intranasal adenocarcinoma has been observed among wood-workers in the furnishing industry. (*H&E* × *90*)

15



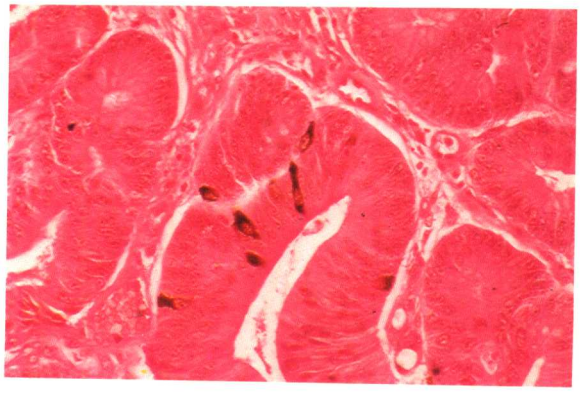
16 Intranasal adenocarcinoma with argentaffin cells From a 62 year old woman. The growth pattern is reminiscent of carcinoma of the large intestine. (*H&E* × *90*)

16



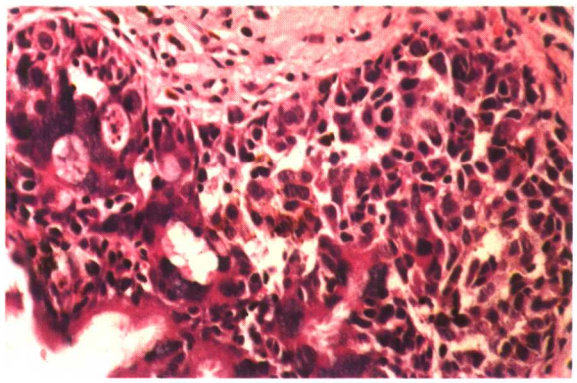
17 Intranasal adenocarcinoma with argentaffin cells Further section of the tumour illustrated in **16**, showing argentaffin granules in some of the cells. (*Masson-Fontana* × *220*)

17



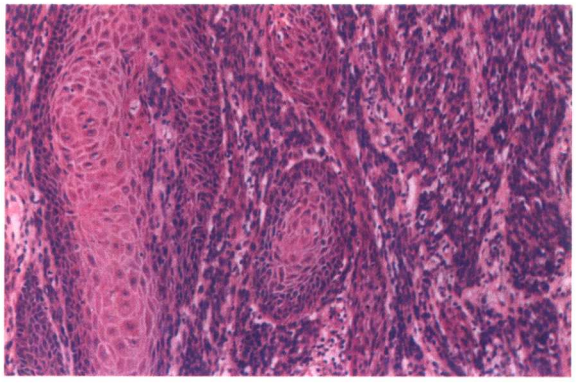
18 Intranasal malignant melanoma From a 76 year old woman. The section shows junctional activity in the mucosa. Pigment is seen in some of the proliferating melanoblasts. (*H&E* × *220*)

18



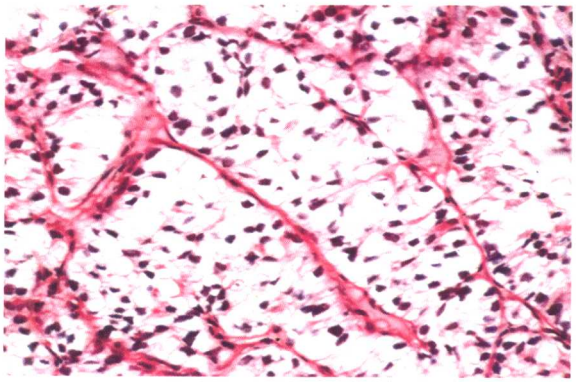
19 Intranasal malignant melanoma Another part of the tumour illustrated in **18**. As the result of an associated pseudo-epitheliomatous hyperplasia of the surface epithelium, the infiltrating malignant melanoma cells are flanked by columns of squamous epithelium. (*H&E* × *90*)

19



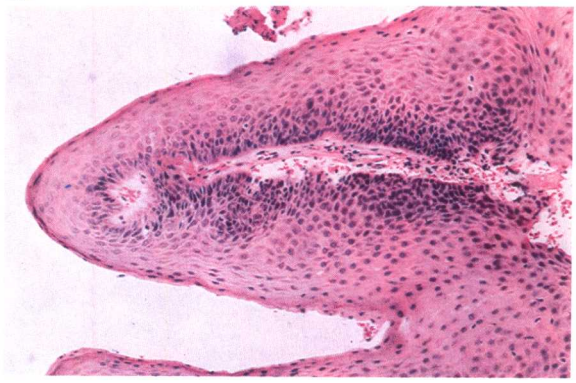
20 Intranasal metastasis from renal carcinoma From a 76 year old man who presented with a polypoid mass in the nasal cavity. Following biopsy diagnosis, the primary renal tumour was demonstrated radiographically. The section shows the typical 'clear cell' pattern and thin-walled sinusoidal blood vessels characteristic of renal cortical carcinoma. (*H&E* × *220*)

20



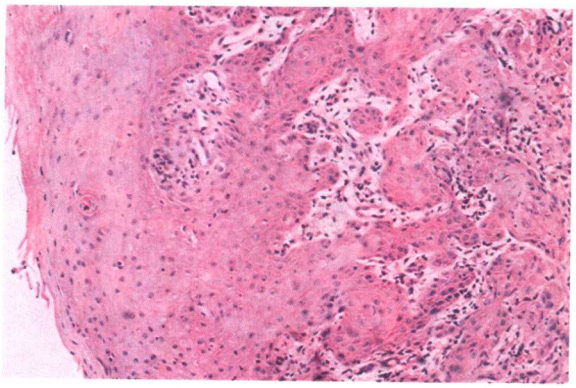
2. Larynx, trachea and lungs

21



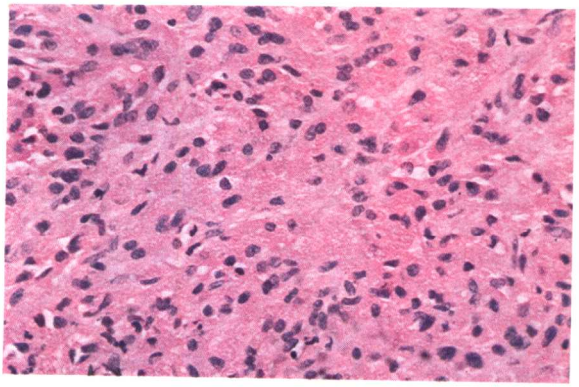
21 Squamous papilloma of larynx Section of a papillary lesion involving the vocal cord of a 3 year old child. The papillary processes comprise fibrovascular cores covered by well-differentiated, stratified squamous epithelium. Such laryngeal papillomas in children may be of viral origin. (*H&E* × *90*)

22



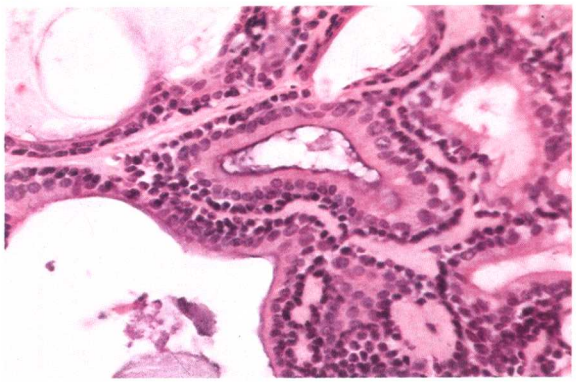
22 Granular-cell tumour of larynx (granular-cell myoblastoma) A lesion of the vocal cord in a 35 year old man. This section shows pseudoepitheliomatous hyperplasia of the overlying stratified squamous epithelium. (*H&E* × *90*)

23



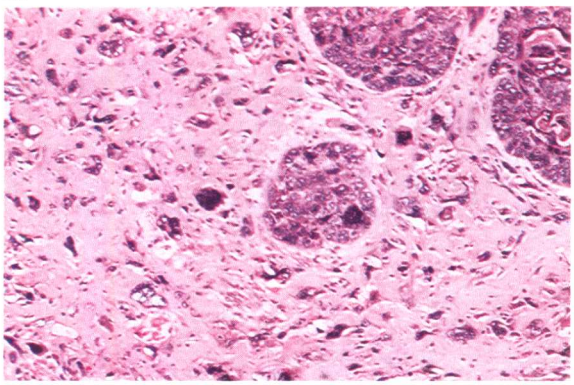
23 Granular-cell tumour of larynx Deeper part of the lesion illustrated in **22** showing typical features of a granular-cell tumour: cells with spheroidal or ovoid nuclei and abundant cytoplasm containing numerous eosinophilic granules. These granules stain red with the periodic acid-Schiff technique. Because such tumours are rare in the larynx, the hyperplasia of the overlying epithelium may sometimes be mistaken for squamous-cell carcinoma. (*H&E* × *220*)

24



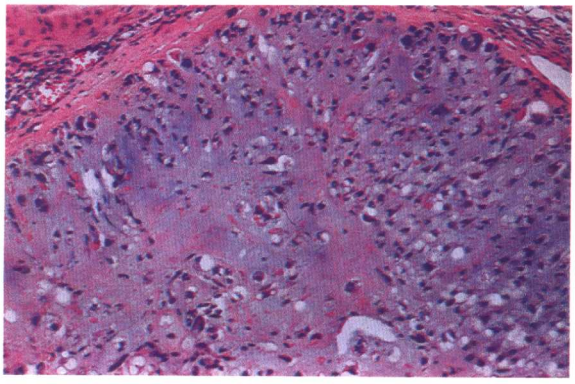
24 Mucous-gland adenoma of larynx Section of a nodule excised from the vocal cord of a 50 year old woman. Note the double cell layer and the presence of basophilic mucin in the glandular spaces. (*H&E* × *220*)

25



25 Polypoid pseudosarcoma of larynx Section of a polypoid nodule arising from the vocal cord of a 63 year old man. There are islands of poorly differentiated squamous-cell carcinoma in a fibrous stroma containing abundant collagen and scattered bizarre cells. The origin and nature of the bizarre cells have been debated, some favouring a mesenchymal origin and others regarding them as altered carcinoma cells. Whatever the precise histogenesis may be, polypoid pseudosarcomas of the vocal cords have a good prognosis: in a personal series of 12 cases followed up for a minimum of 10 years, there was no recurrence or metastasis after simple local excision and postoperative radiotherapy. (*H&E* × *90*)

26



26 Chondrosarcoma of larynx A tumour arising from the thyroid cartilage of a 58 year old man. The neoplasm underwent spindle-cell dedifferentiation, and the patient died with pulmonary secondaries 18 months after diagnosis. Note the irregular arrangement, the nuclear pleomorphism and hyperchromasia of the tumour cells. There is an abundant basophilic intercellular chondroid matrix. The aggressive behaviour of this neoplasm is exceptional. Most cartilaginous tumours of the larynx pursue an indolent course, even when judged malignant histologically. Conservative surgical treatment is usually indicated. (*H&E* × *220*)