Pioneer work by Professor Dudgeon in cytological diagnosis¹

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Professor Dudgeon

Almost 40 years ago, shortly after the end of the First World War, Professor L. S. Dudgeon, Professor of Pathology at St. Thomas's Hospital, London, began to take an ever-increasing interest in cytology. The reason why he did so is not clear but it may possibly be explained in part by his association with the late Dr. C. M. Wenyon, the distinguished protozoologist, during their service with the R.A.M.C. in Macedonia. Dudgeon began to use the cytological method for the examination of fresh tissues from various parts of the body. The technique he employed, the 'wet-film' technique, was very simple. The tissue removed fresh from operation is incised and scraped with a sharp scalpel. The juice thus

obtained is smeared upon a glass slide and fixed, while still wet, in Schaudinn's fluid (used in the study of protozoa), stained with Mayer's haemalum and eosin, and mounted in Canada balsam. Beautiful preparations are made by this simple procedure. As compared with paraffin sections there is less shrinkage and the details of the cell nucleus and cytoplasm are more clearly shown. This is essential because the diagnosis is cytological and not dependent upon the arrangement and disposition of the tissues. Dudgeon always admired the stained films and considered that they were much nicer to examine than the paraffin sections. In conjunction with Partick (Dudgeon and Partick, 1927) and later with Barrett (Dudgeon and Barrett, 1934) he published two papers. The first gave an account of the application of the wet-film method of diagnosis in a series of 200 consecutive cases of new growths and inflammatory diseases. The second described how the method had been extended and applied to pathological processes in general and over 1,000 additional cases had been investigated. In both series of cases the results compared very favourably with those from paraffin sections. In these papers an account is given of the various pictures presented by the more common pathological conditions. The cytological appearances shown by normal epithelium, the various types of inflammatory cells, tuberculosis, Hodgkin's disease, benign and malignant lesions are described and illustrated. Dudgeon did not subscribe to the view expressed by Bland-Sutton in 1922 that 'in the appearance of a cell from cancer there is nothing characteristic of the disease, nothing that would lead a pathologist to identify it as a malignant cell. Cancer can only be identified in sections showing the relation of cells to each other in a group'. In the paper published by Dudgeon and Barrett it is stated that 'from the study of wet films it seems certain that malignant cells are different in appearance from normal cells and that the special histological features are so striking that they can be picked out as isolated units in a large field', and later, 'in a field where benign cells are present for comparison the diagnosis is not difficult.' The comparison between benign and malignant cells as seen in the stained films is

¹Abridged from the Presidential address given at the first meeting of the British Society of Cytology in November, 1963.

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Examples of preparations from Professor Dudgeon's collection

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well brought out and the features which suggest that a cell or group of cells is malignant—the criteria of malignancy—are defined. They do not differ essentially from those in use at the present time. It soon became evident that this method of diagnosis was capable of wide application. It could be used instead of a frozen section made in the course of an operation as a rapid method for the examination of a doubtful breast tumour, or an enlarged lymph gland, or in the out-patient department in diagnosing small lesions of the skin or mouth. In all these spheres of activity Dudgeon played a large part. With the help of his colleagues in the gynaecological department, A. J. Wrigley and R. K. Bowes, he began to use the cytological method in the diagnosis of certain gynaecological conditions and in this connexion papers were published, under his aegis, by Wrigley (1932) in the use of this method in the examination of lesions of the female genital tract, and by Bowes and Barrett (1935) in the diagnosis of lesions of the cervix uteri. Most of the stained preparations made by Dudgeon and his colleagues in those early days are still available and it is remarkable how well preserved they are. Several coloured photographs taken recently from the original smears are reproduced here.

It was Dudgeon's custom to make smears from many different types of specimens—urine, faeces, sputum, pleural and ascitic fluids, etc.—by the wet-film method. One day in examining a specimen of sputum he observed a clump of cells which he immediately recognized as malignant and diagnosed as papilliferous columnar-celled carcinoma. This was

subsequently shown to result from a secondary growth in the lung from a primary in the gall bladder. On a number of isolated occasions in the past malignant cells had been found in specimens of sputum but Dudgeon was the first to institute a systematic examination of patients suspected of carcinoma of the bronchus, and with C. H. Wrigley (Dudgeon and Wrigley, 1935) succeeded in showing that this method of examination could yield 68% of positive results in cases afterwards proved to be malignant. The value of this procedure is now well recognized and has been confirmed by many workers in many parts of the world using a variety of staining methods. Dudgeon continued his work more especially in the field of exfoliative cytology. He began to examine stomach washings. He was always enthusiastic but frequently remarked that 20 years or more would elapse before the cytological method would be generally accepted. His untimely death at the outbreak of the Second World War unfortunately brought his activities to a close.

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