THE possibility that malignant cells might be present and be recognisable as such in pleural or ascitic fluids or in urine has always been present to the minds of pathologists. That such cells may also be found and recognised in sputum, in vaginal secretions or in breast fluids, or even in gastric or rectal washings, is an extension of this idea. A further extension is that cells from the vagina can be shown to exhibit hormonal or other changes.

The term "applied cytology" has been given to these specialised techniques of procuring, fixing, staining and examining material for these purposes. The term is somewhat pretentious and, if anything, adds to the disfavour with which the majority of tissue pathologists still regard these increasingly publicised procedures. Pathologists are already cytologists and we have here no new science set up to displace the routine morbid histology which is the practice of pathologists.

On the other hand, it is also perfectly clear that we have in these techniques valuable accessory and supplemental procedures that can no longer be ignored and which, in fact, call for careful examination as to the exact part they are to be called upon to play in the future.

I have no actual experience of the use of these methods in gynaecological cases, but the literature seems to suggest that in this field lies their greatest usefulness and in America at least they have now attained the position of being regarded as established and accepted procedures in gynaecological practice.

Neoplastic cells in pleural or ascitic fluids will so frequently denote a terminal condition that here the method cannot be of the same interest, but the possibility of being able to detect early cancer of the stomach or of the bladder calls for the consideration of the method in these latter cases. I have little experience myself of the method in these directions.

The most careful consideration, however, should be given to the place that these methods might hold in the examination of sputum. It is not too much to say that in a suspected case of bronchogenic cancer, by the time a bronchial biopsy is positive or a diagnostic radiological picture is available, the patient is already pledged almost irrevocably to a fatal outcome, no matter how brilliant the ensuing surgery. In such cases only earlier diagnosis and earlier surgery can offer improved hopes of success and survival, and at present the technique under discussion of recognising cancer cells in the sputum or in bronchial washings offers the sole method by which such an earlier diagnosis can be achieved.

It seems to me, therefore, that we have here an argument for this technique which can only be set aside on the basis of a reply to a single question, can the pathologist accept responsibility for the diagnosis of lung carcinoma with its implied lobectomy or pneumonectomy on the basis of his ability to recognise malignant cells in a sputum or bronchial washing?

*Communication to Section of Pathology held at R.C.S.I., February 24th, 1955. Demonstrations of the different types of cells were shown, including cells from malignant cases.
The answer is "yes" in a number of cases, and in some of these the evidence is as good as that obtained by biopsy. This number of positives will vary with the experience of the pathologist: in the beginning it will be very small. The value of the method is not confined to the number of positive reports. There are also the occasions on which the findings are reported as suspicious and these reports have their own value when taken in conjunction with clinical, radiological and other findings. A negative finding has no value in any direction. Where a tumour is present but is not in communication with a bronchus, the report cannot be other than negative, and this implies no reproach to the method. The value of the report labelled as "suspicious" is enhanced if it is found repeatedly. It is a special value and feature of the method that it can be so repeated and so the question of having to report on a "single cell" should not in fact arise. There can be little doubt also that this method in the hands of pathologists working in specialised hospitals, where the results can be controlled and checked, can reach a high degree of accuracy. Also it is certain that the technique is susceptible of improvements, improvements which are bound to come when the method is more widely used and developed.

It is a *sine qua non* of this technique that there must be a full degree of understanding between the surgeon or physician on the one hand and the pathologist on the other. The former must be aware of the limitation of the methods in the hands of the pathologist and the latter must be assured of a sympathetic and understanding reception of his reports. The test should be asked for deliberately with full realisation of its implications and not as part of a routine request for "organisms, fungi and neoplastic cells". The collection, fixation and despatch of the specimen must receive the closest attention or again the test become waste of time. Finally, the test is a time-absorbing one and for this reason again must not be lightly asked for.

At the very least, the test for malignant cells in sputum has reached a stage of development at which a pathologist can no longer condemn it untried and, in this regard, it may be noted that a long and extended trial may be necessary. In my own particular case, I have been practising this test on sputum for some fifteen years and like Sam Johnson and the clean linen, I had no great passion for it until I began to receive bronchial washings from a specialised chest hospital. My experience prior to this had, however, the advantage of giving me a large acquaintance with the many types of cells likely to be seen in sputa that are not from malignant cases, and it is indeed almost a diagnostic feature of malignant cells that they are in fact reasonably different from other types of cell.

The commonest objection to the test is based on the grounds that there is no such thing as a recognisable single malignant cell. This is, no doubt, a correct assertion, but is one that has no relation to the matter in hand because nobody does in fact make such an attempt when examining a specimen for malignant cells. As stated previously, the number of cases in which a diagnostic picture is present is small but very helpful, but it is the adjuvant effect of a report as suspicious or as an indication to further diagnostic methods of observation that makes the procedure specially worth while.

It should be recalled that blood smears, marrow smears, smears from