THE PERCEIVED PROBLEM
Atrophic rhinitis (AR) is a chronic disease of insidious onset which, in its fully developed form, can cripple a pig enterprise. Consequently all large herds, and especially breeding herds, need to have contingency plans for dealing with it; i.e. they must know in advance what they will do, or not do, in particular circumstances. AR is not a simple problem, and its effects are not easily measured. The fact that it is a chronic condition; so, herds will need monitoring systems that can quantify the disease and its effects as well as detect its presence. Such a monitoring system for herd use should provide an ongoing picture of the situation in the herd related to its own past and/or current performance, and should give warning of potential problems and clear indications when to take, and to cease, action. It should be based on variables, mostly relevant to AR and its effects, preferably those that can be determined easily, objectively and quantitatively. It should record data and changes in the situation in a valid, easily understood and preferably graphic form. Above all, it should cost least to operate than its value to the herd. Unfortunately this is easier to say than to do. Even when data are collected they are often not analysed effectively; and, all too often, the mathematical and clerical drudgery involved result in their not being analysed at all. Obviously there is a need for a system for storing, retrieving and manipulating data quickly, cheaply and effectively, and it should be capable of presenting the results clearly, preferably in graphic form, with virtually no mathematical input from the operator.

THE PROPOSED SOLUTION
To this end we have developed a prototype computerised Atrophic Rhinitis Monitoring System (ARMS) utilising available modest computational capacity but with an emphasis on graphical presentation. The system is compatible with systems already in use for production monitoring in British pig herds, and it can be used either for ongoing monitoring of a herd or for retrospective investigation. No special personnel or computer facilities are required. Any single variable or a combination of clinical and pathological variables may be used. Parameters used include the number of cases per month, the frequency and/or extent of brachypnea, the clinical incidence of facial distortion, the presence and severity of sneezing and watery eyes, all expressed in terms of either snout grade or morphometric index (Dow et al., 1982).

THE PROTOTYPE SYSTEM
The ARMS software has been written in BASIC to run on a Tektronix 4051 with at least 3K of memory (RAM). The data and programs are stored on magnetic tapes and up to eleven sets of data (e.g. separate herds) can be stored on each DATA tape. The output can be displayed on the screen or printed on a plotter. The system is a menu-driven system; to run the program, the user merely follows instructions appearing on the screen. The menu reads as follows:

ENTER and CHECK Press 1
RECORD, Press 2
DRAW a SCATTER-GRAPH Press 3
DRAW a HISTOGRAM Press 4
... Press 5

Each individual program has its own sub-menu showing the details of its operation, viz:-

ENTER and CHECK. This program allows the user to write data to a DATA tape entering it one week at a time. Missing data is allowed for and each entry is checked for range and for data type.

DISCUSSION
The prototype ARMS represents a practical harnessing of modern computer technology to a situation where taudium probably constitutes an even more formidable obstacle than mathematics to the useful application of data-handling techniques already available but rarely used in veterinary practice. It enables data to be stored, recalled, manipulated and displayed in useful form with ease and accuracy, and in circumstances where the time-cost of professional labour could be prohibitive. It is not, of course, necessary to have an on-farm computer, and indeed a bureau-based system could have considerable advantages to both the farmer and his veterinary adviser. Though the prototype ARMS has been designed to enable a fairly wide range of variables/parameters, others could be substituted or added, if needed, in subsequent versions. Any herd owner seriously concerned with the economic effects of atrophic rhinitis on his herd would want a monitoring system to take account of production parameters (e.g. daily live weight gain, feed conversion efficiency) as well as clinical and pathological variables. The availability of a technique, however, is not an indication for its use; application, and the value of such a monitoring system to him is perhaps the most important thing for the pig farmer to monitor.

CONCLUSIONS
The ARMS prototype gives people who may not have had previous "hands-on" experience of micro computers, a chance to undertake a useful job which will produce interesting, attractive and valuable output for all concerned, especially the data gatheners. In the short term it helps users make better-informed practical decisions on disease control; and the data that is accumulated on the tapes will form the basis for important long-term analyses and future projections.

REFERENCES