When I was asked to deliver the dedication to Dr. Joseph F. Morgan to open this formal symposium, I started to think about what I would say and I came right up against the most dominant characteristic of this man. Those of us who were lucky enough to know him well realize that it took many years to get to know him, because he was a very quiet person, a very warm human being with a dry sense of humor, and, above all, he was a very private person.

When, after his death, I started to go through his papers I found a wealth of information about other people but very, very little about himself. For example: Dr. Morgan was elected a Fellow of the Royal Society in 1961 at the age of 43. Election to the Royal Society is the most prestigious honor in any Commonwealth country. Despite the fact that he presented several major papers to the Society and served on the Editorial Committee, I found in his file at the Royal Society's offices only routine correspondence and a curriculum vitae which had not been updated since 1962. Some of the correspondence asked for this to be updated, but this also was typical of him—he was too busy with science and friends and family and he didn't think it was important to talk or write about himself. Dr. Morgan's titles and publications are listed at the end of this paper and one can see his many fields of scientific interest. For this reason, and because he so rarely spoke about himself, these comments are an attempt to describe the man—not just the scientist.

His reticence was reflected in his work with and for the Tissue Culture Association. He just missed being a founding member by 1 year. He was President from 1962 to 1964 and we do not have a complete list of all the jobs he undertook over the years. He served on nominating committees, editorial committees, the archives committee, the bibliography committee and the chemically defined media committee, and often did a bit of trouble-shooting for other committees too. He was active in the early planning for the W. Alton Jones Cell Science Center in Lake Placid, and therefore it was particularly unfortunate that he was unable to attend the first annual meeting held there in 1971. He was someone you could count on, who would contribute his part without fuss or bombast.

His scientific achievements and abilities were recognized by a list of medals and awards, and only highlights can be mentioned here. He was born in Vancouver, Canada, and started winning scholarships in high school. In 4 years at the university, he spent only 2 years as a full-time student. In the other two he worked part-time as a technician, but at the end of 4 years he had a double Bachelor's degree (in Science and in Agriculture) and the Sadler Gold Medal as the top student in his graduating class. He then obtained a Master's degree in Bacteriology at the University of British Columbia and his Ph.D. in Biochemistry at the University of Toronto.

Over the years he added to his 1941 Gold Medal the Merck Sharp and Dohme Award for the Outstanding Canadian Scientist in 1959, election to the Royal Society in 1961, the Centennial Medal in 1967, and the Canadian Society of Microbiologists Award for Outstanding Scientific Achievement in 1971. It was the presentation of this award which prevented his attendance at Lake Placid that year. Now, in 1977, we are dedicating this Memorial Symposium to him. How can you describe someone like this in a few minutes?

I first met Dr. Morgan in 1947 when we were hired, within a few months of each other, to work in the laboratory of Dr. Raymond Parker in Toronto. You may or may not be aware that the very first tissue culture course was held in that lab in 1948. A photograph taken at that course helps to put tissue culture 30 years ago in perspective (Fig. 1). Virtually everyone using tissue culture in North America gave lectures. They included: Dr. Pomerat, Dr. Earle, Dr. Parker, Dr. Morgan, Dr. Gey, Dr. Hanks, and Dr. Margaret Murray. Many who are now well known were students.
including Dr. Don Fawcett, Dr. Harry Eagle, and Dr. Agnes Stroud. It was a very small group that was involved in tissue culture in those days of embryo extract, homemade serum, homemade glassware and even somewhat limited biochemical supplies.

The real biochemical knowledge of the requirements of cells in vitro was equally small. Baker had produced some excellent work in the 20's and some groups had started to analyze embryo extract and serum; White had produced one synthetic medium, but it required the addition of a few drops of embryo extract. In fact, only balanced salt solutions had received detailed attention. Many amino acids were not available in L forms, several vitamins were available only as crude extracts, and $B_{12}$ had not yet been identified. Many cofactors whose activities are now well understood were as yet totally unknown or only suspected. For example we still occasionally talked about "yeast" and "thymus" nucleic acids and about the "Citrivorum Factor."

Against this background Dr. Morgan was assigned the task of producing a chemically defined medium that would substitute for embryo extract differing from batch to batch and homemade horse serum requiring, for best results, the keeping of one's own horses. With this in mind we can see that Medium 199 was a remarkable breakthrough. Furthermore, when Difco decided to produce Medium 199 commercially, it started the tissue culture supply industry as we now know it.

Two events illustrate the development of Medium 199. One is that the first thing Dr. Morgan did was to prepare a large chart of all available amino-acid analyses of all known biological materials. From this he started working out probable combinations which, after testing in blocks, led to Medium 199. At that time we were inclined to believe that animal cells, like whole animals, needed only "essential" amino acids; and Dr. Morgan's willingness to throw out such concepts and start from fundamentals was a major factor in our current ideas about media. The other memory I have is of a frantic janitor arriving to ask what a half truck-load of sugar beets was doing cluttering up the courtyard of the lab. After having placated the janitor, Dr. Morgan proceeded to work up the beets to produce his own glutamine. These two examples reflect Dr. Morgan's approach to the