

# Annals of Surveying

BY ANDREW GIBSON

Our most advanced modern equipment could never have been foreseen by looking at the prototypes. The Concorde could never have been visualized in 1908 at Kittyhawk. Henry Ford's basic black tin lizzie was an unlikely ancestor for a Continental. The modern computer's development from Univac is as wondrous as if King Kong had fathered Einstein. And, to link this philosophical discussion with surveying, our modern lightweight instant reading E.D.M.'s have come a long way from their forbears.

I refer specifically to the AGA Geodimeter. With immense goodwill towards all of the marvellous instruments of which we have a choice in 1980, I can speak authoritatively only of this one, my first acquaintance being 20 years ago, in 1960, with the model 4.

Model 1 was the device invented in the late fifties by a brilliant Swedish scientist who was not, it must be conceded, trying to measure distances. He was seeking a refinement of the speed of light. But the converse ability, to measure a distance, was inherent in the same machine, and this being realized by the alert Aga Corporation, the Geodimeter was born.

Model 2 was the first working machine. A trailblazer for geodetic work, it had an accuracy and range impressive even today, but it was no lightweight. It was usually hauled, like the Klondike piano, to the summit of some pass, where it was mounted on a concrete pillar, and put to work. I need hardly say that it had little appeal for your average private surveyor, to whom distances of multiple thousands of feet were rarities.

Model 3 was next. It was equipped with its own steel tripod to support its considerable weight, but it was not sufficiently precise to be acceptable to private surveyors for short range work.

This honour was left to the model 4, considered, at the time to be very svelte. My partner and I, convinced that an instrument able to measure miles with an error of an inch could hardly be ignored as a surveying tool, bought one. We spent many arresting hours in Ajax where AGA, the bulk of whose business in Canada was in steel radiators, maintained a warehouse. To handle Geodimeter there was a capable young Swedish engineer, who showed us how to operate it in laboratory conditions. Eager to put it to work, we bade farewell to theory, and headed for our baptism of frost in the hills of York.

There were four separate components for the instrument - the geodimeter itself, two bulky accessories, and, for the considerable power needed for the visible light beam, a car battery. Uniting all this were various cables, and the whole, when assembled with packing boxes, tripods, theodolite and reflectors was enough to make three strong men turn pale, and to make two men of which our all-principal party consisted, feel intimations of mortality.

Although there was a short range daylight capability, in practice it had to be used at night. Oh, those winter nights! While honest citizens were in bed we were dragging our boxes over fences, waking the dogs in the neighbourhood, and arousing the darkest suspicions in the householders and in the constabulary they summoned. Or else we were set up in the middle of midnight highways, in mortal danger of being run down by speeding truckers, half asleep and oblivious of our warning lights.

I must also emphasize that one didn't set the instrument up, point it as easily as a rifle, and almost immediately read a distance. In those vacuum tube days each measurement involved dozens of dial readings, laboriously arrived at using fingers frozen to the rigidity of 6" spikes. This was preceded by an operation known as 'finding the prism' and as likely as not by a delicate adjustment of the lamp's relationship to the kerr cell. The latter was effected by holding a congealed eyeball to a small window for protracted periods.

The dial readings completed, the distances were laboriously calculated for each frequency, and if they didn't agree, the operation was repeated.

I have probably said enough to show that this early EDM work wasn't all fun. Commonly, what with fog patches, lost prisms, snow flurries, run down batteries and the lethargy associated with incipient frost-bite, the eastern sky would be getting light before we were finished. I remember, after one such night, thinking that Scott didn't have it so bad in the Antarctic after all.

But the good weather came, and things got better. The bulk of our daily work, as private surveyors, was still done by taping, but, for all the discomfort and sore muscles it caused, the geodimeter very soon proved to be invaluable for control work. Its accuracy and range compared with modern instruments, and

for the first time we were able to get those fabulous 1/100,000 closures as a routine matter, and measure across lakes and over valleys without triangulation or line cutting.

Recently, reading the AOLS Annual Report for 1961, I was reminded of that freezing winter. In it was the transcript of a presentation at the Annual Meeting concerning an EDM survey recently conducted by the then Department of Lands and Forests. Following this, there were comments by the surveyor who had done the field work, and, sitting in the front row, my partner and I were appalled at the remarks addressed at the instrument which was our pride and joy, and the use of which we were trying to encourage (not entirely altruistically - we needed to make it work to pay for it).

The speaker was, and is, a witty guy and soon the whole room was laughing—except us. I quote from the Annual Report ". . . . . but at the moment I can't see anybody wanting to buy one at all. They are very cumbersome - it takes about an hour to set it up - you spend all night measuring three courses that two good chainmen could have chained and check chained in half the time. And you'd have to have a truck or something to move it."

And so on, and so on. It was hilarious - I'm sure that there was a reference to mules being the most suitable creatures for not only carrying but operating it. I rose and made what I hoped was a dignified rebuttal, but I must say that, being among the first of the EDM true believers, and having staked our all on it and the auxiliary control survey equipment, we could say, with Queen Victoria, that we were not amused.

As we all know, both Tellurometer and Geodimeter, the pioneers, remain prominent in the field, and have been joined by many other excellent instruments. Perhaps, having enlarged on the growing pains of the first one, I may be permitted to observe that our current Geodimeter, lightweight, instant reading, and powered by little more than a flashlight battery, has operated almost every working day for 2½ years in the Ottawa Valley, and has given no difficulty at all.

Now that's progress. I think I'm almost thawed out.

## CORRECTION TO ANNUAL REPORT

Please be advised that the registered number for Mr. James J. Kennedy, O.L.S. is 931. His number is listed incorrectly in the 1979 Annual Report.