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“A Yorkshire surveyor’s early days”

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The Charles Close Society was founded in 1980 to bring together all those with an interest in the maps and history of the Ordnance Survey of Great Britain and its counterparts in the island of Ireland. The Society takes its name from Colonel Sir Charles Arden-Close, OS Director General from 1911 to 1922, and initiator of many of the maps now sought after by collectors.

The Society publishes a wide range of books and booklets on historic OS map series and its journal, *Sheetlines*, is recognised internationally for its specialist articles on Ordnance Survey-related topics.

A Yorkshire surveyor's early days

David E M Andrews (OS Cartographic Surveyor, 1964-2003)

In 1964, David Andrews signed on as a trainee surveyor with Ordnance Survey. Here, he recalls some of the memorable moments from his first thirteen years.

I suppose this story starts on a scout camp sometime in the summer of 1962. It was at that camp that I first met Dennis Miles, the new District Commissioner for Scouts in the Bridlington district. At some point we must have been discussing what he did for a living, and he said that he was a surveyor with Ordnance Survey working in the Scarborough field office. It must have been a detailed discussion, and I must have said something like, "*that must be an interesting job*". The result was that he invited me to visit the office and spend a few hours seeing what was entailed.

Up to that time I had my heart set on joining the Army, and even at the tender age of fifteen I had made enquiries about joining the Junior Leaders' Regiment at Bovington Camp, Dorset with the idea of a future in the Royal Tank Regiment. This was very much against my father's wishes. He had spent WWII as a sergeant in the Corps of Military Police, (before they became "Royal"), Special Investigations Branch, (SIB), Middle East Forces, in Cairo, Suez, Cyprus, Ismailia, Port Said, Kantara, Palestine and Crete. He must, therefore, have been very relieved when I came home from my day in the Scarborough OS office and announced, "Forget about the army Dad, I'm going to be a surveyor with the Ordnance Survey".

So it was that on 5 February 1963, following an initial enquiry to the OS head office in Tolworth, I received a letter summarising the main points of the recruitment of Cartographical Draughtsmen and Surveyors. Qualifications needed were at least three GCE passes from the following subjects; English Language, Mathematics, Geography, Art or Technical Drawing or a comparable subject, a Science subject, (other than Domestic Science), a modern or classical language, Surveying. The starting salary for a "Basic Grade" at age 16 was £297 per annum rising over 16 annual increments to a maximum of £973 per annum. If I ever reached the dizzy heights of a "Chief Grade", (the equivalent of a Chief Surveyor), I could earn as much as £1,401, rising to a maximum of £1,697. A sign of the times: "Women and girls are employed only on drawing duties."

I underwent an interview the following September in Manchester; and just under two months' later, I received a letter instructing me to report to the Superintendent at the Field Survey School in Southampton at 8.00am on 14 January 1964 to start a nine month training course. This letter also informed me that my starting salary would be £306 per annum.

As instructed, I presented myself at the Field Survey School where the Superintendent, Bill Sillence, greeted the newcomers to Basic Survey Course 133. I

was required to sign the Official Secrets Acts of 1911 and 1920. Blimey, this was beginning to get serious!

By October 1964 I had completed the basic surveyor training course during which I had learned the principles of chain survey, the resurvey of National Grid 1:1250 scale mapping from either Chain or Tacheometric control, the Overhaul Revision of 1:2500 County Series mapping onto National Grid Sheetlines, the Continuous Revision of 1:1250 and 1:2500 scale National Grid mapping and surveys for Her Majesty's Land Registry at 1:1250 and 1:2500 scales. Towards the end of the course, students were asked their preferences for areas to be posted to if vacancies existed there. I expressed a wish for "anywhere in the north of England east of the Pennines". I wanted to be close enough to the Scarborough area to be able to get home to my parents regularly because my father had begun to suffer some ill health. I was called into the Chief Instructor's office and was told, "Well David, I have good news and bad news for you. The good news is that you are going north. The bad news is that you will be west of the Pennines, and west of mainland England. You will be going to the Isle of Man".

For the three months between finishing training and the start of the posting to the Isle of Man I was posted to Field Survey Group 62 with an office in Denton on the outskirts of Manchester. The work there was the 1:1250 scale Resurvey of Ashton under Lyne and Stalybridge from tacheometric control. Sometimes it was necessary to tape through the mill buildings to the canal banks when they coincided with the mill wall. I had to very quickly learn to cope with the often ribald comments from the female mill workers on seeing a young male stranger walking past them. The other memory of those three months in the outskirts of Manchester was that the official vehicle used by the section was a Thames 15cwt minibus with a three gear column change. I was warned the first time I drove it to never use second gear, always shift straight from 1st to 3rd and 3rd to 1st. I forgot this advice of course, and discovered that once in 2nd gear the gearbox refused to move out again, either up or down. The only remedy was for the front seat passenger to lift the engine cover between the front seats and clout the linkage with a lump hammer to knock it into neutral. My colleagues were all experts at driving in only first and top gears, (and reverse of course), and I didn't make that mistake again.

At the beginning of January 1965 two sections of surveyors, (six Grade IV surveyors and two Grade III surveyors), travelled to start work on the Isle of Man. All except one managed to catch the ferry from Liverpool to Douglas on the day booked. The odd one out was me. My train from Scarborough to Liverpool was severely delayed by snow on the Pennines, and I arrived at the pier head just in time to wave goodbye to the others as they sailed away down the Mersey. I spent the night in a cheap hotel near the pier head and caught the ferry the next morning.

The next 12 months were spent on the 1:1250 scale Resurvey of Douglas and Onchan from Air Machine control. We had the bonus of being able to volunteer as

marshals for the TT Races, and the later Grand Prix, that year, and my parents and young sister came over to the island for their summer holiday.

The resurvey of Douglas and Onchan was done as a repayment job for the IoM government, so everything was being done to a budget, with the result that the Air Machine, (AM), control left a lot to be desired in terms of accuracy and density. However it provided invaluable experience in problem-solving and initiative. The problems experienced with the control may have been a contributing factor to why, in June 1965, I received a letter from the Region Manager in Harrogate telling me that, "The work you have produced so far leaves some doubt in my mind as to whether your present progress will enable you to reach the required standard...I feel sure that you have a good grasp of the basic survey techniques, and your course at the Field Survey School showed that you have the qualities to make a good surveyor". The problems with the AM control were still there of course, and I received another letter in September noting that I was making a determined effort but that, "your period of probation ends on 13 January 1966, by which time you must demonstrate that you have attained a satisfactory standard of proficiency".

I was the last surveyor to leave the IoM in December, 1965 and my next posting was to Cockermouth where the work would be the overhaul of the 1:2500 scale County Series maps. Just after starting work in Cockermouth I received a letter stating, "the improvement in your work has been maintained and as your conduct and health have been satisfactory during this period, I now have pleasure in confirming your appointment to an established post in the Civil Service".

I spent only two months in Cockermouth before my desired posting to Scarborough arrived, with the expectation that it would last "indefinitely". I think that a major factor behind this posting was compassionate due to my father's deteriorating health. He had suffered a devastating stroke and was recuperating at home and no longer working as a junior school teacher in Filey.

The work in Scarborough was initially the 1:1250 scale resurvey of Scarborough, Eastfield, Scalby and Newby. Dennis Miles, the Scout District Commissioner, was still in the Scarborough office and we were able to renew our friendship before he was promoted to Grade III and left Scarborough.

Getting permission to enter private property wasn't usually a problem. After explaining why Ordnance Survey needed to take measurements in private gardens, that at a scale of 50 inches to one mile a dimension as small as the length of my foot could in theory be plotted on the map, and things like garages, house extensions, greenhouses etc were shown on them, permission was usually readily given, often accompanied by the offer of a cup of tea. Just occasionally a more lengthy explanation was needed, and only very rarely was permission refused. In these cases it was often possible to survey the required detail without setting foot in the prohibited garden by using shots and straights from the neighbouring gardens. However, on one occasion I knocked on a front door in a more affluent part of Scarborough and a couple of old ladies answered. After I had explained what I

wanted to do they readily allowed me to access the rear garden through a bolted gate. As I walked down the very long back garden I heard them close and bolt the gate behind me, and I mentally praised them for their security awareness. I spent some twenty minutes taking measurements down at the end of the garden, surveying the several sheds and greenhouses. As my work was drawing to a close I was tapped on the shoulder by a young police constable. He demanded to know what I was doing in the garden, and after explaining my work to him, and showing him my OS Certificate of Appointment, he was reassured.

There were, on rare occasions, greater difficulties in gaining access to private property. The smaller and less valuable the property the more effort it took to convince the occupier that it really was necessary to be in their garden to measure up the physical, (NOT legal) boundaries, sheds and greenhouses. Occasionally the argument was lost, despite the provision of the surveyor's Certificate of Appointment and the occupier telephoning OSHQ to confirm identity and the reason for the survey. In these cases it was often possible to complete the work remotely from the neighbouring gardens. In complete contrast there was never a problem in gaining access to the grounds of what could be classed as "stately homes" or large estates. On one memorable occasion the Fourth Marquess of Normanby, of Mulgrave Castle in North Yorkshire welcomed the updating of the maps, and even placed his chauffeur and Range Rover at my disposal for the duration of my work on his estate. Similarly when I knocked on the door of Settrington Hall the door was opened by the butler. When I explained the purpose of my visit the butler exclaimed, "How wonderful! His Lordship would love to talk to you". I was invited to enter and follow him to the study. I glanced down at my very muddy wellington boots. I was instructed to remove them and leave them on the doorstep. Thus it was that I was ushered into study of Samuel Storey, Baron Buckton, in my stockinged feet, and I spent the next two hours studying the old estate maps and explaining the work of Ordnance Survey, the task of revising the 1:2500 scale County Series mapping, transforming it from a county based Cassini projection onto the national Transverse Mercator projection, using rectified aerial photography to do the bulk of the survey work, and completing it by graphic ground survey methods to end up with a new metric map with National Grid coordinates.

When the 1:1250 survey was reaching completion we started work on the Overhaul of the 1:2500 County Series mapping of the surrounding areas on the North York Moors and the Yorkshire Wolds, covering an area bounded by Flamborough Head, Malton, Pickering and Whitby.

In November 1967 I received a letter inviting me to attend the Efficiency Bar Examination to be held the following January in Battersea Town Hall. This was the last barrier to be breached to become a fully qualified OS surveyor. It was an examination based upon the management structure of the Department and the technical methods used. However, before that could take place the Foot and Mouth Disease outbreak of 1967 meant that all rural work in North Yorkshire was

halted, and all the Scarborough surveyors except one were posted to a temporary office in Skipton to start the 1:1250 scale Resurvey of Ilkley. The one remaining surveyor in Scarborough was to work only on the Continuous Revision, (CR), of the Scarborough town 1:1250 plans.

I attended the Efficiency Bar Examination, and when the results were published I was relieved to see that I was one of the successful candidates.

In October 1968 I was trained in Air Ground Revision. Air Ground, (AG), is a technique of using rectified aerial photographs, viewed stereoscopically, to fix “control points” by radial intersections and trisections on the photographs. The intersected points are then used to fit small areas and trace the ground features from the aerial photographs onto the surveyor’s Field Survey Document (FSD). This was the method used to revise the majority of the 1:2500 scale County Series maps and convert them into the new 1:2500 scale National Grid series maps.

It was while I was revising the 1:2500 scale plan of Flamborough Head that I was standing on the cliff top in front of the Fog Horn Station. It was a Wednesday, and up until then I was unaware that every Wednesday at noon the fog horn was tested. When it went off I was leaning out over the cliff top to look at the foreshore detail. My OS career nearly ended at that moment with an involuntary leap into the North Sea.



Flamborough Lighthouse © Philip Pankhurst - geograph.org.uk/p/3704948

One of my colleagues, (let's call him Jim), was given the task of updating the maps covering RAF Staxton Wold on the northern scarp edge of the Yorkshire Wolds. He presented himself at the gatehouse one morning asking to be admitted to survey the detail inside the security fence. He was refused entry on the grounds that it was a security installation. Jim insisted that RAF Staxton Wold was not included on the list of "S" establishments held by Ordnance Survey and therefore he had to survey the detail inside the security fence. There followed a long argument between Jim and the site security officer, concluding in entry still being refused. Jim returned to the office towards the end of the day and reported the events to the Grade III surveyor, who telephoned the OS Region Office in Harrogate to check whether Jim or the RAF was correct. He was assured that RAF Staxton Wold did not appear on the "Secret" list held in Region Office. So it was that Jim presented himself at the gatehouse again next morning. Now Jim was a very determined and tenacious Northern Irishman, and he was not prepared to give way when he thought he was in the right. There were many telephone calls made in the next couple of hours, RAF Staxton Wold to MoD, MoD to OSHQ Technical Security Section, OSHQ to OS Region Office in Harrogate, all culminating in an eventual admission by RAF and MoD that he should be allowed into the establishment to survey the detail. With a sense of triumph Jim spent the afternoon surveying all the detail, and the next morning in the office he inked up all the pencil work on the field document. Within an hour of that being completed there was a telephone call from Harrogate. "You must erase everything inside the security fence from the field document. Someone somewhere has made an error and RAF Staxton Wold is SECRET and should have been included on our "S" list". It did, and still does, seem a little bizarre that installations like RAF Staxton Wold and RAF Fylingdales were classed as "Secret" and therefore not to be mapped, despite them both being highly visible to traffic on the A64 and the A169 respectively.

This was a very happy time for me, being paid to work in the North York Moors and the northern part of the Yorkshire Wolds, areas that I had loved walking in my pre-work times. By that time my father had suffered a few strokes and was medically retired. On occasion I would pick him up on my way from the office to my plan to give him a day out. On one such occasion I left him in the official van, explaining that I had to climb up onto the roof of the church tower in Rillington, (on the A64 between Scarborough and Malton), to check that the triangulation bolt and witness marks were still present. As I climbed up the last vertical ladder to the roof, having picked my way over the bell frames in the belfry, I was aware that the top of the ladder was swaying away from the wall. The bolts holding the top of the ladder to the wall were completely rusted away. I carried on because I was in reach of the final trap door and I emerged onto the narrow parapet between the spire and the wall. I busied myself with finding the bolt and witness marks and measuring between them. I was then disturbed by my father's voice behind me. He had become bored sitting in the van and had decided to join me to see what I was doing. He was unsteady on his feet at the best of times as a

result of his strokes, and the next half hour was spent gently guiding him back down to ground level with visions of having to call an ambulance and the fire brigade to extract him from the church tower, with all the repercussions that would involve with OS management. Note: no Health & Safety risk assessments in those days, just use of common sense. It would be many years later before I was required to do an Elevated Structure training course, by which time the need to check such bolts etc. had been made unnecessary due to the adoption of GPS for survey control points.

Part of the task of OS surveyors is to provide surveys for Land Registry, (LR), which form the basis of the Title Plans issued by them. On one occasion I was asked to survey a new estate of bungalows in Filey for LR. A few days after the survey had been sent to them a response was received from LR saying that the developers were saying that the surveyed position of the fencing between two parallel rows of bungalows had been shown incorrectly by OS. I went back out to site, checked my survey of the fencing, and found nothing wrong with it. The survey was sent back to LR and a few days later we received another statement from LR saying that the developer was still disputing the survey of the fencing. This time my Grade III surveyor accompanied me to the site. As we drew up in his car we noticed some activity by fencing contractors around the disputed fencing. Leaving all evidence of our true identities in the car we casually approached the contractors posing as prospective buyers of one of the new bungalows and enquired about what was going on. The response from the foreman was, "We've got a panic job on, some government surveyors will be coming out in the next couple of days and we've got to get these fences shifted before they get here". We returned to the office in Scarborough and relayed this conversation to LR. In due course we were asked to revisit the site, at the developer's expense, and survey the new position of the fencing. When the "new" positions were compared with the "old" positions it became clear that the fencing contractors had originally been supplied with a mirror image of the developer's plan from which to lay out the fencing.

In October 1975 I was asked to test and report on the use of the AGA12 Electronic Distance Measurer as a replacement for the Kern Tacheometers used up to then to provide control for 1:1250 scale surveys. The AGA12 could be mounted on top of a Wild theodolite and at the touch of a button could measure the distance to a prism up to 1500 metres away to a claimed accuracy of +/- 5 millimetres in just fifteen seconds. I was somewhat sceptical of this claimed accuracy and I insisted upon setting the theodolite up on a Permanent Traverse Station, (PTS), and measuring to a bank of prisms on another PTS about one mile away. When the measured distance was reduced to sea level and horizontal it agreed with the computed distance to within 2 millimetres. I never doubted the technology again.

The arrangement of very accurate long distance measurements and angle measurements in one piece of equipment, although bulky and heavy, was the forerunner of today's very much lighter and compact "total station" equipment.

During the very hot summer of 1976 the whole of the survey workforce of OS was engaged on Bench Mark perambulation. The Bench Mark lists were to be put on sale to the public and this task was to make sure that the lists were purged of any Bench Marks that had been destroyed or damaged beyond use. I was allocated an area of Swaledale, Arkengarthdale, Wensleydale and Bishopdale stretching from Richmond in the east as far west as Kirkby Stephen and Sedburgh. I soon became expert at locating Bench Marks with only 10 metre National Grid references and vague descriptions such as, "pivot in rock 230 metres west of junction of streams". (No hand held GPS in those days to help find them!).

In September 1976 I was observing with the AGA12 on the new and unopened A19 viaduct over the River Tees in Middlesbrough when one of the prisms mounted on a tripod was blown over by a gust of wind and broken. I consequently have the record of being the first OS surveyor to write off one of those prisms. Thanks to a very understanding Grade III supervisor I was described as "responsible" and "not negligent", so I was not required to pay for a replacement.

It was in this period that I was assigned to the New Edition Preparation of a 1:1250 scale plan under the new A19 viaduct. It was a plan of predominantly terraced housing and every one of those houses had a bay window abutting onto the pavement. Although all the bay windows abutted onto the pavement by less than 1 metre they needed to be shown because the specification for 1:1250 scale mapping included them precisely because they abutted onto the pavement. For some reason they had not been shown on the previous editions of the plan, so I was faced with the task of surveying 1,927 bay windows, comprising two different shapes, (one curved and one angled), onto the Field Document for the New Edition. Naturally it took some time to measure and plot all of these accurately, so I was dismayed when the "classing" section at OSHQ refused me an allowance of "House Units", and consequently time, for surveying them. The result was that I was well over the allowed time for the New Edition Prep. My dismay was further deepened when, within six months of my survey work, all those terraced houses were demolished, even before the New Edition of the plan was published.

In May 1977 I was invited to an interview before a Promotion Board for Surveyor Grade III vacancies. Having interviewed successfully, I attended a series of "Initial Management Training Modules".

In September 1977 the Stockton-on-Tees office closed and all the surveyors were transferred to the Darlington field office. The work was still the 1:1250 and 1:2500 scale Continuous Revision of the area surrounding Darlington, Northallerton, Richmond and Stockton on Tees, Catterick Garrison and Swaledale.

Three particular events I recall whilst doing tachy survey in Catterick Camp. With two field labourers I pulled up at the Royal Signals barracks gatehouse one morning in our trusty Bedford Beagle to ask permission to enter the barracks and conduct a control survey for some new buildings in the barracks. The pleasant young sentry allowed us in with no problem. We spent the day doing a recce and placing nails and pegs to mark our instrument stations for the survey. We then finished for the day, intending to arrive next morning to start the instrument work. Bright and early next morning we arrived to see the same young sentry by the barrier, but this time in flak jacket, helmet and armed. The day before these items had been nowhere to be seen. Also the barracks were surrounded by layers of razor wire which had appeared overnight. We asked permission to enter and were refused. "You'll have to get permission from the Garrison Security Officer at Garrison HQ." Off to Garrison HQ we trooped, where we were told that the Colonel was too busy to be able to see us. Over the next four hours we were passed to and fro between various ranks before we got to see the man, who I came to realise, was the person who actually ran the army, the Garrison Sergeant Major. All then was explained. On the previous afternoon an IRA car bomb had been exploded outside the officers' mess in Aldershot. Security had been upgraded on all military establishments overnight, hence our access problem. The Garrison Sergeant Major was most apologetic, and whilst some security checks were made on us, and photo ID cards produced for us, we were treated to lunch in the sergeants' mess. Armed with our photo IDs signed by the Garrison Sergeant Major our access problem was solved. The only warning, "Please don't try to enter any buildings unless you are accompanied by someone in uniform, the chaps are a bit jumpy".

Later that week we were ready to set about observing from the traverse station at the end of a traverse. We had planned on using a buried block on the hill top on the tank ranges that we had found earlier in the week and we set off to mark its position. As we drove up the concrete road, on rounding a bend, we were met by a Scorpion tank coming down the hill towards us. We braked sharply and the tank slid to a halt with its gun pointing directly at our windscreen. My labourer in the front passenger seat raised his arms in mock surrender to the great amusement of the tank commander. That obstacle negotiated we drove on to mark the buried block. It was a few feet from a fence, so to make its position visible from the barracks we stuck a survey ranging pole in the ground next to it, and tied orange fluorescent sheeting on the fence behind. It was now 16:00 on a Friday afternoon, so back to the office for the weekend, intending to observe to the block first thing on Monday morning.

Monday came, and after setting up the tacheometer in the barracks we looked for the ranging pole and the orange sheeting. No sign of either! We drove back up the concrete road to find just a crater where the block, pole, sheeting and fence had been. We found the block about 50 metres away down the hill. When we made enquiries on return to the barracks we were told that that the ranges had been in

use over the weekend and some enterprising tank commander had seen a lovely orange practice target.



Alvis Scorpion (Creative Commons Licence: photograph Gaius Cornelius)

Before we could finish off the tachy traverses in Catterick Garrison we had to observe one final short traverse to link two other traverses which would otherwise be too long under the rules. To make the link we had to place a peg in the back lawn of a major's married quarters. At recce stage we had asked permission from the major's wife who told us not to bother knocking on the door when we came to observe, "Just let yourself into the back garden". We duly did so, and I noticed Dave, my forward staffman seemed a little distracted when he was in the garden. When I came to occupy the peg I realised why. In the middle of the lawn, stretched out on sunbeds, were the major's wife and her two daughters, all stark naked and reading their Mills & Boons. Three cheery smiles and "Good mornings" from them, and they returned to their books. I tried to keep my mind on the task in hand, that is until I was tapped on the shoulder by one of the naked daughters who asked if we would like tea and biscuits. I politely declined, left the garden, and warned my rear staffman what to expect when he entered the garden.