CHAPTER XVI COMBINED OPERATIONS HEADQUARTERS

Denis Shoppey, who I relieved at C.O.H.Q., was a most remarkable man. Having turned over the experimental department to me, he was given the job of keeping track of the whereabouts of landing craft, an obvious necessity which had so far been neglected. Before you could say 'passed to you', he had built up a sizeable empire, almost entirely from dockets originated by himself. He soon had a bigger office, more staff and longer lunch hours than before I took over from him. Alas, he overdid it and others began to cast envious eyes on his expanding economy. Once again he was relieved of his post, this time by a Captain Dorman-Smith, who soon had an even bigger staff. But they were able to tell you where any particular landing craft was, or ought to be.

It was not long before I, in my turn, became the subject of a 'take-over' as C.O.H.Q. began to expand. Captain Tom Hussey, a term-mate of Lord Louis, arrived from an out-station at Southsea with members of his staff and I became his No. I on the naval side, with Major Cosmo Salter representing the Royal Marines and Major Armstrong-Macdonnell, the army. For some reason the R.A.F. were not represented in our department.

Bridging the water gap was probably the most important single problem given to the experimental side to solve and this involved getting vehicles ashore from landing craft which had grounded some distance from the shore. On flat beaches this was likely to be quite a long way, depending naturally on the draught of the craft concerned. For the actual landings it was agreed that vehicles should be waterproofed so that they could run with their engines submerged but this was a major modification and took a great deal of time and effort so that it was hardly practicable for the main bulk of vehicles.

In the first place it was necessary to discover first what gradient the beaches had in order to work out the depth of water at the ramps of landing craft and ships with any given load. For the many types of vessels involved and the variety of beach slopes possible it was a monumental task to calculate and record all the possible combinations. This was one of the tasks given to me in 1942 and, I regret to say, it was incomplete when the invasion took place. In fact, I think it was to all intents and purposes a labour of Sisyphus, incapable of completion.

My assistant was an R.N.V.R. Lieutenant, John Wymer, who was an engineer and who spent most of his time away from C.O.H.Q., either arranging or carrying out trials and experiments. He was an able chap but not always inclined to follow the usual channels, particularly where paper work was concerned. Every so often a very distressed Wren from the filing department would appear and say Lord Mountbatten or one of his deputies wanted a top secret file at once and it was marked out to Lieutenant Wymer, what could she do? The only thing to do was to get someone to open Wymer's 'press', a steel cupboard much in use in government offices. This usually meant cutting it open as duplicate keys were either not allowed or not available. A large hole was cut in the back of the press and then re-welded when the papers had been retrieved. After this had happened several times we decided it would save a lot of trouble if we did not bother to re-weld the piece cut out and from then on we had only to move the press out from the wall, retrieve the required docket and replace the press. Unfortunately, on one occasion this was done by some busy little Wren while one of the security officers was in the room and, of course, a large sized balloon went up and Wymer nearly went with it.

I found Tom Hussey very easy to get on with and he was a popular figure, especially with the female staff.

He was tall and handsome and had lots of charm but this did not always go down with some of the more senior members of the staff. Commodore Ellis, who commanded H.M.S. 'Norfolk' at the sinking of the 'Bismarck' was reputed to have a rather fiery temper and he was certainly no lover of procrastination. There was some particular information he had asked our department to obtain and for some reason it was not produced at the required time. Ellis sent for Tom Hussey and by the tone of the summons he was not in a very good mood. I was with Tom at the time and he said to me:-

"You get on well with Ellis, Middleton; you go and see what he wants; I have a meeting in the Admiralty".

With that he seized his cap and shot off while I made my way to the Commodore's office on the fourth floor of the new Scotland Yard building. I knocked and on being invited to enter, poked my nose round the door, saw the window was wide open and said:-

"Do you mind shutting the window, sir?"

"What the devil do you mean, Middleton?" Where's Tom Hussey?"

I explained that I considered it unsafe to enter his office with the window wide open as in his present mood he might throw me out and that Tom Hussey was at a meeting.

Commodore Ellis laughed, walked over and shut the window and then said:-

"Tom is lucky to have you to do his dirty work for him. I suppose he did not want to try and make excuses himself. Well what is the answer?"

I told him briefly how far we had got and why there had been a delay, which he apparently accepted without question. He then proceeded to give me a long and interesting lecture on some geological question, which I have now forgotten, but it was probably something to do with coastlines and beaches.

In the early days, before C.O.H.Q. had achieved the sort of staff it later commanded, Tom Hussey would go through most of the paper work at the end of the day when he returned from a succession of meetings and tell me what he wanted done about each one. I would scribble rough notes on each docket and then retire to my office to write the necessary signals, minutes or letters, often finishing very late at night. One day at a meeting which both Tom and I attended there was no stenographer available to take minutes so he turned to me and said:-

"You write shorthand, Middleton, will you take the minutes?"

"I'll take the minutes", I replied "but I don't do shorthand".

Tom looked at me in amazement.

"But surely you do! How do you get down all that stuff I dictate then? You always get word for word just what I have said".

I explained that I only scribbled very brief notes using easy contractions and that really all I needed to know was his general opinion. I am not sure that he was entirely convinced by my explanation or entirely happy about it, if he were convinced.

With, but not of, Combined Operations executive were numerous odd little outfits, all doing training or experimental work designed to bring off some sort of coup or baffle the enemy somehow or other. Major 'Blondie' Haslar had been working with Tom Hussey at Southsea and ran a small private army (if that expression can be used in connection with Royal Marines) devoted to small scale raids in canoes but also interested in other methods of transport in, on or over water. I remember Blondie pleaded hard to be allowed to drop with one of the first airborne life-boats and also suggested walking across to the Isle-of-Wight from Southsea on the sea bed. Wearing diving apparatus, of course. He was, I believe, absolutely fearless, as were most if not all

the other people involved in strange combined operations projects. Another member of the experimental team was Sir Malcolm Campbell, who was always inventing things and with his wide business connections was able to get his ideas carried to the prototype stage. One of his gadgets was an instrument for measuring the compactness of beaches. This was one of the things planners needed to know in order to decide whether track would be needed for vehicles landing. Malcolm's device was very simple. You first stuck it in the sand, sat on it and it registered the softness, or hardness of the beach according to a pre-arranged scale. He wanted to test this in situ and tried very hard to lay on a special expedition to land him on one of the proposed beaches at night so he could get some useful readings. His proposal was not approved. Malcolm also appeared to be quite fearless and I always had the idea that he was looking for an opportunity to go out in a blaze of glory. Like Admiral Sir Walter Cowan, I believe he had a horror of dying in bed.

In the autumn of 1942 we heard that the King was going to visit C.O.H.Q. and on the great day we all paraded on the terrace of Montague House to be presented. I had just shipped my volunteer decoration ribbon, the medal having been presented to me by Lord Louis, who said he was doing this on behalf of the King. I think I was honoured to have a presentation at all as there were many more important things to think about at the time. Lord Louis was interested to learn that I had completed 20 years service in the Reserve, the necessary qualification for the volunteer decoration, as the R.N.R. officers get theirs in 15 years.

Every officer had been told to extend his hand to be shaken as the King came along the line and reached the man next door. My neighbour was Major Armstrong-Macdonnell, who was in the Irish Guards and wore one of those funny flat peaks to his cap which sit

right on the nose obscuring the vision. The King spent some time talking to me and all the time Armstrong-Macdonnell's arm was stuck out in front and he looked just like a blind man soliciting alms.

The King, in fact, was asking me what medal ribbon I was wearing as he could not recall having seen it before. As a medal expert (and designer of ribbons, I believe) he was clearly puzzled and Lord Louis immediately chimed in and explained all about it.

"But you cannot have served 20 years in the Reserve", said His Majesty, "You must have been about two years old when you joined, if you have served that long. How old are you?"

I replied that I was 38, whereupon the King smiled, turned to Lord Louis and said:-

"I told you so!"

We all noticed that the King appeared to be heavily made up like a movie actor and when news of his grave illness was released it seemed likely that this had been done so that photographs would not reveal the fatal signs in his features.

During this time my wife and daughters were still living at Tenbury Wells and there seemed little point in moving them as our house at Ruislip was let and I did not anticipate that it would be easy to get our tenants out. So I asked my sister, who also lived at Ruislip, if she would have me as a lodger and I lived very comfortably with her and her husband, John Vinton. I was away on the coast quite a lot and often kept very late hours. I rarely left C.O.H.Q. until quite late in the evening and about once every ten days remained on duty all night fire watching. I had sold my car before going to Egypt so I had no means of getting about. Most of my friends appeared to use bicycles so I thought it would be a good idea to get one, if I could, As none were being put on the market, second-hand bicycles were at a premium.

I happened to mention bicycles in the mess at C.O.H.Q. one day and our establishment officer, Lieutenant Jacobs, said he had a bicycle for sale. Fixed wheel, in good condition, six pounds. I bought it.

When people enquired as to how I proposed to get my bicycle to Ruislip I replied:-

"Why, ride it, of course" But I must admit I did not really fancy riding a fixed wheel machine through all the London traffic. When Malcolm Campbell heard about it he was enthusiastic and said,

"I will get Vella up here to overhaul it for you before you go".

At first I thought he was joking but it appeared he was not and sure enough Vella arrived and took my bike to pieces and put it together again without the slightest sign of feeling it beneath the dignity of the world's land speed record mechanic.

Another interested spectator was Douglas Fairbanks, junior, who had arrived at C.O.H.Q. some time beforehand wearing a war medal ribbon which intrigued everybody. None of our people had medals for the current war; not even those who had seen a good deal of serious combat and they were interested to learn that the Americans got a medal for being posted overseas. Within a few weeks Douglas Fairbanks had quite a sizeable collection of medals but, of course, he stood no chance against Lord Louis' kaleidoscopic collection.

At about five o'clock on a summer evening an enthusiastic and distinguished gathering awaited my departure by bicycle for Ruislip. Vella pronounced all parts functioning correctly, Malcolm gave me his blessing and the other onlookers released a spontaneous but discreet cheer. I proceeded firmly out into Whitehall and commenced the long journey to Ruislip. Being a fixed wheel machine, mounting presented some difficulties, as you could not push off with your foot on a pedal, or rather, it required slightly more skill than I possessed. Short of someone to hold the bike while I mounted, I needed a handy kerb of the

right height, so I had determined not to stop anywhere if I could avoid it, in case I could not get going again.

War-time traffic was comparatively light and I threaded my way down Piccadilly into the park and out again at Lancaster Gate. Down Notting Hill I worked up to speed and after one or two near shaves in the maelstrom of Shepherd's Bush, arrived at the start of the Western Avenue. Passing through the factory area at Perivale large numbers of girls workers were streaming out onto the road on their bikes and for the next few miles I endured some embarrassing remarks and received some interesting invitations, which my fixed wheel made it impossible to accept. Unfortunately, about half a mile from my destination I had to stop at a cross roads and getting under way again proved every bit as difficult as I had anticipated. But I made it.

Shortly before this incident I had been promoted to Commander and now sported a very impressive brass hat. Like everything else in war time, brass hats were in short supply and I went to Gieves determined to see what my old friend, Mr Kingston, who had kitted me out for Pangbourne 25 years before, could do for me. At the appropriate counter a sympathetic assistant listened to my requirements and shook his head sorrowfully. He said there was a long waiting list and could not hold out any hope for some weeks. I could see Mr Kingston in his little office at the back so I said to the assistant:-

"Would you tell Mr Kingston that Eric Middleton, whom he kitted out for Pangbourne in 1918, wonders if he could help him?"

The assistant did as I asked and I saw him bend down and speak quietly to Mr Kingston, who looked up at him and said:-

"Middleton? A brass hat? He can't have, he's only a boy!"

He looked round, saw me, came over and offered his warm congratulations, then went and fetched some brass hats and saw me fitted correctly. I left with the coveted headgear in a paper bag

as I could not wear it until I had also shipped the appropriate lace on my sleeves, a job which I also left to Gieves. It cost a good deal of money.

The events leading up to my getting promoted to Commander are sufficiently unusual to be worth recording. The senior members of Tom Hussey's staff from Southsea had gone up a step in rank when our department was given higher status and Tom became Director of Experimental and Operational Requirements. I pointed out that I was at some disadvantage in my dealings with the other services as I was now junior to them and in any case I would like to get back to sea again. Apparently Tom saw C.C.O. who agreed that an application should be made to the Admiralty for my promotion to Commander. It was typical of Tom that he said:-

"You know what's required so draft a suitable letter and I will sign it".

When I took the letter to Tom for signature he said:-

"I understand it is far more difficult for an R.N.V.R. officer to get promotion to Commander than for a Royal Navy officer to become a Rear Admiral but if you are as good as this letter suggests they may even make you an Admiral!"

He signed the letter and presumably it was countersigned by C.C.O. I had a friend in the 2nd Sea Lord's office and he told me one day 'in confidence' that I was almost certain to get a brass hat as they had had one of the best recommendations ever seen. I diplomatically refrained from telling him that I knew because I wrote it.

In case anyone should think my promotion to the acting rank of Commander was, therefore, quite phoney I would say that in the half year promotions next year I was promoted to Commander proper on the permanent list of the R.N.V.R. and thereby joined a very

select band and some distinguished names.

Not long after getting my promotion I was walking along Whitehall to the officers' club in Craig's Court for lunch. This was a most excellent establishment run by a charming lady whose name I am ashamed to say I have forgotton. The meals were always good, the one minor drawback being the prevalence of pigeon on the menu. The proximity of Trafalgar Square may have had something to do with this and I daresay the cook had only to put out her hand to collect one from the window cill. With me were two of my military colleagues, I think Armstrong-Macdonnell and his No. 2, Hamish Stewart. As we proceeded north we could see approaching in the opposite direction a tall saturnine figure which we immediately recognised as Lord Reith, and he was in naval uniform.

"He hasn't got a brass hat", said Hamish excitedly. "He'll have to salute you".

Sure enough he did. It was not really a smart salute and it was something of a mixture of all three services' methods and a gracious wave but it was clearly meant to be a salute and I returned it with what I hoped was a suitably grateful acknowledgement.

Hamish was delighted and on return to C.O.H.Q. spread the good news to all departments. "Middleton was saluted by Lord Reith today".

So much interest did this incident arouse, that a few days later a party was organised to accompany Middleton down Whitehall in the hope of meeting His Lordship once more and demonstrating the finer democratic instincts of the navy. Away we went and sure enough, there in the distance was the tall, unmistakable figure, wending its way southwards. But what was that I saw? Hamish saw it, too, and the disappointment in his face was obvious. That craggy head had a cap with gold lace on it. He had been promoted.

Through a gap in the crowd we saw his full figure - he had four stripes! He had been promoted to Captain from Lieutenant-Commander in four days.

Middleton saluted Reith and our sad little party continued to Craig's Court. Of course, it was pigeon on the menu that day.

One of my earlier missions was to accompany two of my army colleagues on a tour of investigation to find a suitable site for a combined operations experimental establishment and we commenced with a survey of Barnstaple bay, where the beaches and terrain generally appeared to meet requirements. We walked miles on beaches and approach roads and somewhere on Braunton burrows we were about to cross a strip of sandy dunes when one of the soldiers suggested that it was probably mined. A discussion took place, during which it was suggested that I should go first as I was the lightest of the party. I promptly replied that this was not logical thinking. If I went first and got across safely they would still not know for certain that the strip was not mined and possibly their greater weight would set a mine off. If they went first and crossed safely I should know with reasonable certainty that it would be safe for me to cross, which was much more sensible. But they outnumbered me two to one so I went first.

On arrival at Appledore we were more or less apprehended by members of Admiral Franklin's private navy and led before him. Admiral Franklin was serving in the rank of captain as Naval Officer in Charge; N.O.I.C. to use the normal short title. He had been at sea as a commodore of convoys, had been torpedoed and invalided out of sea duties. He lived at Northam, near Appledore, and had, I believe, done so for many years.

When we appeared before him he was very fierce and tore us to pieces for not reporting to him before making free of his territory.

"Who are you?" he said. "You might be Hitler, Goering and Goebbels for all I know".

We looked suitably embarrassed but not unduly guilty as a signal had been sent to him from C.O.H.Q. asking for permission for us to do a survey and saying that to save time we would examine beaches as we approached from Ilfracombe. Even so, the Admiral considered that his authority had been flouted and it was not a very good start. Yet it was fairly clear that the proposed establishment would add considerably to the importance of his command and in due course not only ourselves but the Americans were operating in force in the rivers Taw and Torridge and the beaches outside. I spent a lot of time at Appledore on experimental work and in due course Admiral Franklin and I became firm friends, but not until we had had one or two fairly sharp differences of opinion.

I soon became very involved in the problems of supply of petrol and oil to the invading armies and papers relating to a proposed Hais cable began to appear on my desk. The 'Hais', I learned, stood for Hartley Anglo-Iranian Siemens, the joint progenitors of a hollow submarine cable to be used for pumping petrol across the channel. This was followed by the Hamel steel pipe, the Hamel standing for Hammick and Ellis.

Whereas it was comparatively easy to imagine laying a large hollow submarine cable across the channel, if one ignored the problems of increasing water pressure at depth and the enormous amount of friction in a long, small bore pipe, the idea of a similar operation using welded 3 inch mild steel tubes appeared ludicrous. Even in lengths of 40 feet these pipes appeared to be remarkably rigid yet exhaustive trials proved that they could be bent round a cylinder 30 feet in diameter and pulled off again relatively straight and without kinking.

The problems of manufacture, storage and eventual laying were immense and at times I felt that we were attempting the impossible. I attended all the Section F.F. P.O.L. (Petrol Oil Lubricants) meetings at C.O.H.Q. with Tom Hussey and in his absence took the chair. There were usually between twenty and thirty people present, including American Oil experts, John Jameson, managing director of the Anglo-Iranian Oil Company and senior representatives of the other companies, besides service chiefs.

I soon found that at this type of meeting a vote is never taken, presumably because in matters of life and death it would be embarrassing to have records of who made a fatally wrong decision. Also, a draft copy of the minutes was circulated to all present for approval and these invariably came back with major corrections on them, so that the minutes as finally put in circulation had very little similarity with what had actually been said at the meeting. In fact, sometimes it was quite difficult to word a decision in such a way as to make it fit the recorded discussion. I not only found this very frustrating but it also led to matters being debated a second or even third time after a decision had been made and, therefore, retarded progress unnecessarily. So, when I was in the chair, after a discussion had been arrived at, I would say:-

"In order to ensure that your decision is properly recorded, gentlemen, I will dictate the appropriate minute now" and proceeded to do so. At first some members protested that it was a waste of time but as I had details of the time taken by the other method they had no option but to agree that mine was more satisfactory. I never heard of the same system being used at any other meetings but I am sure it helped to get the Pluto project along.

Pipe Line Under The Ocean, which gave its initials to the code name 'Pluto', was possibly one of the most brilliant of all war-time

ideas and the fact that it was carried to such a highly successful conclusion says much for the team working under A.C.Hartley, Hammick and Ellis. The demands on the resources of the country while preparing for the invasion of the continent were such that every piece of equipment had to be fought for. Men were even more difficult to obtain and I well remember a meeting on the question of manning the ships and craft of the 'Pluto' force held at the Admiralty under the chairmanship of the Second Sea Lord himself. All sorts of possibilities were suggested and turned down until at last one of the civilian members of the committee suggested that two L.S.T's, which had been allocated for some special purpose, were not now required and, therefore, their Polish crews would be available. This was seized upon with great signs of relief and the diffident proposer of the idea congratulated warmly. The Second Sea Lord quietly poured icy cold water on the scheme.

"Unfortunately, the crews of the L.S.T's you mention only exist on paper, anyway. We shall have to do better than that!"

In the event, of course, men were found.

My first practical work on the petrol and oil problems involved handling small tankers off the beaches before the pipe lines could be laid and this involved laying a short pipe-line from the vessel to the beach, or rather, vice versa. This was nothing new as long pipelines used similarly had been in operation before the war, one at Miri in Borneo being over a mile in length. On beaches held by the enemy conditions did not permit the same techniques being used and with a party of Royal Engineers I proceeded to Appledore to carry out experiments.

First of all I had to get some moorings laid off Westward Ho beach and all attempts to get Admiralty assistance proved abortive. Eventually on the 'old boy' network I learned that the R.A.F. had a mooring vessel in the Bristol channel which dealt with moorings for Air Sea Rescue craft

and targets. I visited the moorings officer, a Squadron Leader Weblin, at Millbank and he proved a real friend in need. In fact, from then on I placed all my mooring business with the R.A.F. on very advantageous terms. The work was always carried out most efficiently and in quick time. As my mother used to say "There are more ways of killing a cat than choking it with butter".

I spent many days in all weathers on and off the beaches around Appledore and carried out numerous experiments and trials with the help of the Royal Engineers allocated for the work. We tried floating pipelines, hauling pipelines out from the beach and every possible variation we could think of. Where lines were floated with the aid of empty drums, the difficulty was to release the buoyancy in such a way that it all detached at the right moment. If some drums remained attached it could fracture or seriously bend the pipeline and over a long distance we found it impossible to devise a means of releasing the drums simultaneously. Wires stretched or kinked and quick release gear jammed or twisted owing to wave action. Then one of the sappers suggested using 'cortex', an explosive cord which was reputed to detonate over its whole length at the same instant.

We anchored a floating pipeline about 200 yards long off-shore with a length of cortex running from drum to drum in such a way that the explosion would cut the lashings. I never did like explosives and always mistrusted the stuff but I had to take charge of the boat and watch with some trepidation as the cheerful sapper made ready to fire. He glanced at me to see if I were ready and on my nodding set the stuff off. There was a sizeable bang and empty drums flew all over the place, one or two missing our boat by inches. But some drums remained firmly fixed and although the sappers went on trying they never got the system to work reliably.

Eventually we progressed to the point where we could pretty well guarantee success and after some trials with a small tanker loaned by the Ministry of War Transport we announced that we were ready to give a demonstration. We went over the drill time after time to try and avoid any hitches and both the C.R.E. and I were firmly of the opinion that the method we had so painstakingly involved was the only suitable one for use on the invasion beaches. I pointed out that from bitter experience I knew that unless our demonstration went through without the slightest sign of a hitch, the Generals who were coming to witness it would turn it down flat. Worse, they would start producing ideas of their own and insist on us mounting fresh trials with them in spite of the fact that we would undoubtedly have tried and discarded them already. The bane of the experimental and trial officers life is the fact that people will assume that he has restricted powers of thought and almost invariably say:-

"Have you ever thought of doing so-and-so?" or "Why don't you try so-and-so?"

Of course, nobody can claim a monopoly of good ideas and any experimental officer is pleased to be offered useful suggestions but when he says "We have tried it and it did not work" he would be happier if people would believe him and let him get on with something useful. Time is rarely on his side and does not permit special demonstrations to prove a failure is a failure is a failure.

On this occasion I determined that there should be no doubts about it. It had been arranged that when the pipeline had been laid and connected up to the ship, water would be pumped through it from the ship's tanks to a container on shore. Nothing was likely to be more convincing than liquid pouring out of the pipeline connected to the ship. But just in case something silly went wrong like a valve jamming or the line breaking, I had a large pump

installed in an old shed with a suitable supply of water and a pipe from this laid underground and connected to the point where the ship's pipeline would be attached. If on the signal for the ship to pump nothing happened I arranged for our auxiliary system to be started up so that water would appear to flow from the ship's pipeline, as expected.

The day came and apart from the fact that one of the visiting officers, a Brigadier, insisted on going to sea in our tug and got very seasick, the running out and connecting up of the pipeline, and the pumping, worked like a charm.

The very senior officer who had come down from London to appraise our efforts, was duly impressed but could not help remarking:-

"What would you have done if the demonstration had failed? I had some ideas of my own but, of course, there is not much time for further experiments".

Foolishly, no doubt, I explained that as far as he was concerned, the trial was almost bound to appear successful and I told him how and why. He was very cross indeed and complained to C.O.H.Q. where Tom Hussey administered a mild rebuke before saying he thought it rather enterprising. Having done a good deal of organising at different times, I was fully aware of the fact that a trial or demonstration is like presenting an entertainment. It must be kept simple so that there is only the slightest chance of anybody forgetting what they are supposed to do or how to do it and the presentation must be as dramatic as possible. Many trials I attended were just done without any previous rehearsing of techniques or dummy runs. Usually they flopped and everyone had wasted their time.

During these 'Ship to shore' trials I naturally came in close contact with N.O.I.C. Appledore, Admiral Franklin, and until I got a small party of seamen of my own I had to use his private navy, all of whom, of course, spoke broad Devon and always considered an order in the light of whether the Admiral would like them to do it or not. On one occasion we had several boats out and the Appledore seamen were insisting on doing things their way, with disastrous results. I knew the Admiral was watching us from on shore and when I went to report to him, he ~~merrily~~ merely said:-

"Well, Middleton?" in a rather aggressive tone, which told me he was expecting me to blame the failure on his chaps.

"I made a mess of it, sir" I announced. "I'm going to try again tomorrow".

The Admiral smiled pleasantly.

"Well, well, we can't be right every time", he said and asked me to have a drink.

Next day his men did exactly what I told them and from then on things went very smoothly indeed. Later Tom Hussey said that the Admiral had been loud in his praises of me and certainly we were very good friends as long as he lived. If one could only say the right thing at the right time, every time, how much easier life would be. Certainly it is very true that it never pays to make an enemy where you can make a friend.

Another major project for the invasion was the artificial harbour, later known as the 'Mulberry' and a great deal of time, thought and experiment was expended on the problems this involved. Tidal conditions are very different on the French coast from those obtaining on the English side and every possible factor had to be taken into consideration in deciding what sort of equipment would be most efficient.

One morning a pile of papers was dropped into my basket by one of the Wrens who were continually whisking in and out with bright smiles and attractive legs. I shuffled through them to see if there was anything new and my eyes opened wide as I picked up a small sheet of paper headed, I think, Prime Minister's Office, on which was written in a firm hand:-

"Artificial harbours. Of course they must go up and down with the tide. Get on with it and don't argue" or words to that effect. I took it in to Tom Hussey and said:-

"Winston's written you a little billet doux" as I handed it to him and retired promptly in case one or the other exploded. In fact, I did not have a great deal to do with the Mulberry project as it seemed to be very much an Army baby. All the same, it gave me a good deal of work in one way and another as there were always some naval problems connected with it.

The problem which, like the poor, was always with us, was our old friend 'bridging the water gap'. I arranged and attended trials of all sorts of systems all over the place and in all I must have made hundreds of reports and written thousands of words on the subject. My colleagues on the experimental side were all equally engaged on this or similar projects plus a host of Alice in Wonderland ideas. Lieutenant-Commander the Earl of Antrim got involved in a fiendish machine with the engaging code name of 'Panjandrum' This was in effect a gigantic double catherine wheel full of high explosive, designed to charge up a beach breathing fire and destroy any walls or other defences ahead of landing tanks. I well remember the noble Earl's description of the trial and how 'Panjandrum' ran amok scattering the invigilating brass hats in all directions.

I once took part in trials of some of the Duplex Drive tanks, as they were called. These were tanks provided with screw propulsion as well as tracks and enormous folding canvas topsides which floated the heavy vehicle somewhat precariously. The trials took place at Langstone harbour and I went afloat in one of these unlikely craft with General Martell for a companion. When we beached we came in alongside the L.C.T. from which we had launched and as she swung to the tide one of propellors started to slash our flimsy seeming flotation. Fortunately we got ashore before we sank but I decided I preferred more conventional vessels. General Martell maintained an icy calm and surveyed the scene calmly with his one remaining eye. I have no idea whether these D.D. tanks proved to be of any value in the assault but they must have consumed a great deal of time and energy in their production.

One of the object lessons, at least to me, resulting from continuous contact with ideas and inventions in war time, was that a great deal of time and energy was expended on trying to produce new weapons and not enough on devising and arranging proper training with those we had already. I remember discussing this question on the Normandy beaches with an officer of the Guards Armoured Division, later on, and he agreed wholeheartedly that he would far rather have had his men well trained in the use of the older and smaller tank gun than barely trained in the use of a new, super weapon with which they were going into battle. No doubt his superiors disagreed and certainly the force would look better on paper.

At the same time it must be admitted that many ideas well repaid the efforts spent on them as most certainly did the 'Pluto' project and the 'Mulberry' harbour. All ideas had to be examined and evaluated but there appeared to be a conviction somewhere in our supreme command that if we tried hard enough we would be able to produce an Aladdin's lamp or a genie in a bottle, which would win the war with a rub or a whispered command. I suppose that is exactly what did happen in the end when the ultimate weapon, the thermo-nuclear bomb, was produced. But this has proved of extremely doubtful benefit to the Anglo-American races and might well be likened to a genie who refuses to go back into the bottle.

Naturally there was a great deal of trial and experimental work with landing craft and I spent quite a lot of time afloat in various types. One trial was with a very tough bunch of commandos and involved launching small assault boats down the ramp of an L.C.T. at sea. These trials were very successful but I shuddered to see the way these highly trained and very fit men flung themselves into the boats in a whirl of flailing legs and heavy boots. There were quite a lot of cuts and bruises but nobody seemed to mind. I noticed that their captain wore the ribbon of the Victoria Cross and it would not have surprised me if they had all won similar decorations. Throughout my service with combined operations my admiration for our troops increased daily.

I also took part as an observer in some cliff landing trials off Dartmouth. With us we had some American movie camera-men to film the proceedings and although they appeared fearless themselves they bluntly refused to get their cameras anywhere near the water. I wanted to show clearly the four foot swell that was breaking at the foot of the cliff and pointed out that shots taken from 20 feet above the water would make it look like a flat calm but they refused

to be budged. When the film was shown later atC.O.H.Q. everyone said "Oh, but it was a flat calm" and no protest of mine would convince them otherwise so again it was rather a waste of time. When I arrived at Dartmouth for the trial I found an old friend awaiting me; none other than Admiral Sir Walter Cowan, looking like an elderly, impish boy scout in khaki shorts and carrying a shepherd's crook. He had asked permission to accompany us and, as I uneasily expected, later tried to take part.

Off the cliff the landing craft let go a stern anchor and as she was veered down closer and closer to the sheer face of rock the commandos carrying weapons and all sorts of gear on their backs leapt for crevices and precarious foot and hand holds and proceeded to climb swiftly, fanning out as they did so. I just stopped the little Admiral from making a flying leap through the mounting spray and had a rather difficult couple of minutes trying to convince him that I was in command and if he disobeyed my orders it would be mutiny. I do not know whether this had any real effect and produced visions of being strung up at a yard-arm or reduced to the ranks or whether he realised I would be in an invidious position if I lost him. Probably the latter. At all events, he remained in the boat with me, rather obviously thinking black thoughts.

It has always been one of my great regrets that, unlike most of our leading service chiefs, I obeyed the instructions not to keep a diary in war time. Had I done so I could no doubt have written a much more detailed account of what happened at C.O.H.Q. from April 1942 until June 1944. As it is, I can only rely on memory and as any D.C. would be quick to point out in court, at a distance of nearly thirty years this can be very unreliable.

Some incidents stick firmly, having impressed themselves for one reason or another. Others are as if they had never happened, unless invoked by some other influence.

Amongst other projects for which I was responsible were some surf landing trials to determine which of our existing landing craft were most suitable for work in the Pacific and what type of craft should be constructed if none of the existing models filled the bill. I got a team together and having provided them with the necessary landing craft, installed them at Padstow, where there was a nice selection of beaches producing surf of varying heights according to weather conditions. In charge of the party was a young lieutenant R.N.V.R. named Cowper Coles, who proved an excellent man for the job and who later on earned distinction in small craft.

It must be explained that surf, technically, results from the waves of a disturbance many miles away and is not caused by local wind and waves. The long swell from a distant storm arrives, often in a flat calm, and only breaks as the approach to the shore shortens the distance between the crests, causing them to pile up impressively and finally present a sheer or even overhanging front before breaking. If in fact it is blowing hard when a swell arrives off a beach the wave length will be shorter and the wind will cause a break before the rearing-up and plunging breaker can occur. Of our team at Padstow a young New Zealander was by far the most proficient handler of a boat in surf, having learned the business on his native shores. It was simply incredible what he could do, driving a boat in on the beach, turning it under engine as successive waves lifted it enough and finally climbing out through and over the fearsome-looking line of breakers off-shore. Under his tuition the others all became much more confident and eventually I reported that the existing L.C.P(L), developed from

the original Higgins 'R' craft, was undoubtedly our best boat for the purpose but what was needed was a surf training school for coxswains. I pointed out that we had an excellent nucleus for this in Cowper Coles' outfit but other problems were considered of higher priority and as far as I know the suggestion was never implemented.

My visits to Padstow were almost always made by the night train from Waterloo, which departed about 1.0 a.m. arriving at Bodmin Moor station about 7.0 a.m. Here I was met by a car from Padstow, usually driven by a very attractive Wren named Ann Richards, whose father was a retired naval commander living at Appledore. Having spent the night in the train I was usually ready for breakfast and so we used to repair to the hotel in Bodmin where they produced a real old fashioned English breakfast, which had not yet heard about rationing. This still left us time to arrive at Padstow for the start of the days work which often meant plugging out round Trevose head and into Constantine bay for trials.

These innocent breakfasts proved to have far reaching effects for it was not very long before a well-wisher informed me that there were some convincing stories going round about myself and an attractive young Wren and that we frequently spent the night at a secret Cornish hotel. I pointed that if all the people who had breakfast together could be assumed to have slept together there would be some pretty strange bedfellows. When I told Ann Richards about the stories she gave me a speculative look as if trying to decide whether this was a roundabout way of putting a proposition.

During this time at Padstow, Dr. Tom Gaskell, an Admiralty scientist, was carrying out some wave measurement trials with which I was also concerned to some small extent. I became extremely interested in waves as a result of this and other trials and experiments. During the Normandy landings Dr.Gaskell had to go over to France for some scientific purpose or other and at the last minute it was decided that he must go in uniform as in the somewhat unlikely event of him being captured he might be shot as a spy. As a result one of the combined operations party lent him a uniform, in which I believe he was something less than a driving fit and it made him look so suspicious that he was nearly arrested as a spy by our side.

Solly Zuckermann and J.D. Bernal attended a number of meetings at C.O.H.Q. at which I was present, principally as adviser on seamanship aspects. I was on more than one occasion the only person present who did not possess a university degree and it was not unusual for my learned colleagues to refer a proposal to me finally with the question "Can it be done?" I was always astounded at the tremendous range of knowledge stored in the brains of these intellectuals, including some unusual pieces of information which appeared to indicate a love of life as well as learning.

There was one delightful incident in which Professor Bernal was involved. One of his pet theories concerned the value of slow explosions. This may sound like a fantasy but in fact he explained and later demonstrated that with coal dust it was possible to produce an explosive mixture of great force which, while possessing the power to destroy a building, went off so slowly and gently that it would not injure a human being with its blast.

To demonstrate this, Bernal had a small brick building constructed and then by some means was able to distribute about a pound of fine coal dust in the atmosphere inside. He then announced that he would go inside, ignite the explosive mixture and we would see that the result would be that the walls would bulge outwards slowly but surely and eventually disintegrate. He himself would be unharmed. He did as he had said but in fact he was not entirely correct. The walls behaved exactly as he had forecast but he had forgotten the roof, a portion of which came down and hit him on the head. I still believe there must be a market for slow explosions.

After a number of minor trials with the Hais cable designed for project Pluto it was decided to carry out a full scale lay across the Bristol channel from Swansea to Watermouth on the north Devon coast, the idea being that if it proved successful, petrol could be pumped from the oil refinery at Llandarcy, just outside Swansea, and thereby save a great deal of transport in getting fuel to the south coast.

A ship of 1500 tons, the 'London', had been allocated and converted into a cable layer and Captain Treby-Heale R.N.R. an ex cable ship master, was appointed in command. The completed vessel was re-named 'Holdfast'.

Captain Treby-Heale was a great character. Well over sixty years of age, he had been in the United States with a Gilbert and Sullivan company when war broke out. His last appearance, I believe, was in the chorus of the 'Gondoliers' so there can be little doubt about his versatility.

I was given the job of organising the naval side of the operation and repaired to Swansea, where we had a large meeting attended by all who were to take part or had a major interest. Flag Officer in Charge, Cardiff, sent Commander Despard as his representative and I assume this was the same Despard who was badly wounded in the gun accident in H.M.S. 'Harebell', mentioned in an earlier chapter. All the Swansea pilots concerned were there and some of these of course remembered me from my days in 'Roger Beck'. One of them endeavoured to take the floor as soon as I opened the meeting and commenced to tell us all how the job was to be done. I shut him up politely by saying that as I had all the information at my finger tips I proposed to explain in detail how I proposed the operation should be performed and then throw it open to the meeting to criticise. I went through the details from start to finish, omitting I hoped not even the smallest item and explaining every move minutely. It took me over an hour and at the finish there was a unanimous indication of approval. My pilot friend was good enough to come up to me afterwards and say "I didn't think you had it in you". I was rather surprised at this in view of the salvage of the 'Marwarri' and 'Lochgoil', which had benefited the pilots' association to no small amount and for which, I think, I deserved their thanks.

I went on board 'Holdfast' on the day of the lay and Treby-Heale went off at the rate of knots as if he was paying out spaghetti. He completed the lay without a hitch, no doubt to the tune of "We sail the ocean blue" from H.M.S. 'Pinafore'. This highly satisfactory result must have pleased the planners and I daresay Winston was impressed as it was one of his babies. A.C. Hartley was naturally delighted and the production of Hais cable in quantity was put in hand. I think it is true to say that he looked on me as

a useful ally at C.O.H.Q and often asked me if I could get something done that was holding up progress. I noticed that most of the big bills came to me for a confirming signature. One was for a gigantic quantity of petrol, lost somewhere in the pipeline across the Bristol channel. I was not prepared to accept this and after some investigation and argument saved the taxpayer a sizeable sum. The biggest bill I had to counter-sign in connection with operation 'Pluto' was over a million pounds. I wish I had been on a small commission!.

The Hamel pipeline was being constructed at a special site at Tilbury. The forty foot lengths of 3 inch mild steel pipe were stowed in banks and fed by gravity to a production line where they were automatically electrically welded and reeled on to enormous floating drums with the code name 'Conundrums'. The whole thing looked like something out of a nightmare and it was difficult to believe that this rigid-looking metal tube could be laid on the ocean bed like a cable. But it was, very successfully

Just before the invasion, when I was at Southampton, there were four or more loaded 'Conundrums' at moorings off the Netley beach and one day I noticed that there were divers down alongside them. Afterwards I discovered that when they went to move one of the 'Conundrums' the tug master noticed that it did not tend to revolve as it had done when he put it on the moorings. Fortunately someone listened attentively to his remarks and on investigation it was found that all the drums had grown such a crop of weed and barnacles below the waterline that they would have certainly failed to function as intended. It is rather surprising that someone had not thought of the necessity for anti-fouling.

The water gap went on being a problem, particularly with the L.S.T's, which drew nine feet aft and one of the proposed solutions made by the Americans was a small, double-ended L.C.T. which would ply back and forth between the ramp at the bow of the L.S.T. and the shore. These were produced very late in the day and the planners were eagerly awaiting the arrival of one of these L.C.T(6)'s as they were designated. At last we received a message that an L.C.T.(6) would be available at the Combined Operations Experimental Establishment at Appledore and I was instructed to proceed forthwith and report on the trials.

At this time the Americans were in Appledore in force and had a splendid Mississippi river steamer as headquarters ship. She looked rather fine moored off Bideford but her Atlantic crossing must have been a bit trying for her crew. By invitation I joined the American Admiral and his staff, who had also come to see the trials, and we all piled into a Dukw for the trip to Crow point, where the L.C.T.(6) had been ordered to await us.

As our Dukw left the beach and commenced the crossing of the river at Instow, I could see the L.C.T.(6) not off but on Crow point and either she had been built with an extraordinary hog or she had broken her back. My American friends saw what I saw but said nothing. The Dukw beached near the L.C.T. and we descended from her and walked to meet a young American ensign, apparently captain of the L.C.T. who was approaching. With his cap on the back of his head and a most engaging smile he said to his senior officer:-

"Say, Ad., she don't seem to have made out so good!"