

WASC 2243

ARE Journal
Golden Jubilee
number

May 1954

des.

We came across the enclosed in the effect of a cousin when we were cleaning her house - Her brother, Michael Smilt worked at Fort Halstead. The record of AFE's 50th Jubilee contains the seating plan (Brewin + Johnson) plus numerous luminaries and famous names - (Rother Silkenood & Thornhill + Poole) etc. The summary of the High Jinks contains some background history too. - Perhaps it will add to the archive?

Best wishes

David H

(DAVID HEWLETT)

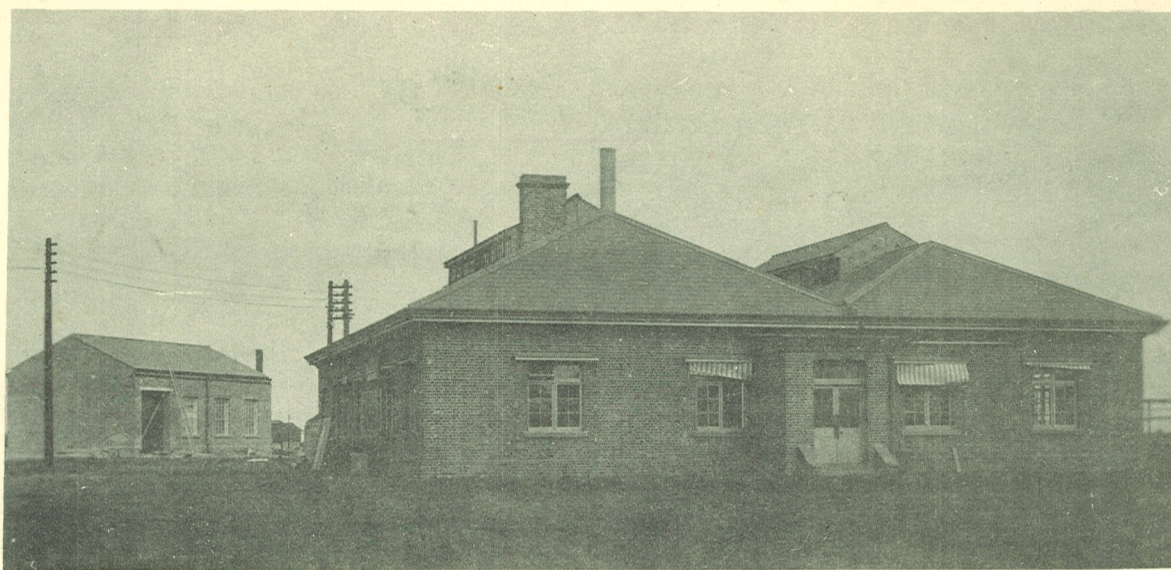
M2C

ARE JOURNAL

Number 15

GOLDEN JUBILEE NUMBER

May, 1954



THE MAIN LABORATORY 1903

From a Photograph kindly lent by Dr Silberrad

IMPORTANT

The A.R.E. JOURNAL is an unofficial publication, but it contains items of official information such as appointments, promotions, locations, etc.

It is felt that items of this nature are of general interest to the staff and that they should continue to be published, but their publication is conditional on there being no breach of confidence.

Strictly speaking, official matter of this nature should not be communicated to any person not in the Ministry's service. However, it is not thought reasonable to debar your family from reading the JOURNAL, but you are earnestly requested to coöperate by ensuring that it is confined to yourself and your immediate family.

When you have finished with your copy, if you do not wish to retain it personally, please bring it back to the Establishment and either return it to the Technical Secretary(ARE)'s Office or to your local JOURNAL distribution centre; or pass it to a member of the staff who has not seen it².

THE EDITORIAL COMMITTEE

J. S. Grew (Tech.Sec.) Chairman and Editor

C.M.Bean (SXA Woolwich)

W.A.J.Brightman (Admin. Branch, Fort Halstead)

G. Small (Carpenters' Shop, Woolwich)

W. Styles (Machine Shop, Fort Halstead)

H.C.H. Foster (Admin. Branch, Fort Halstead) ... Secretary

Contributions to the 'Journal' may be sent to any of the above.

* For reasons of economy, we do not now print more than one copy for every three persons on the books of the Establishment, but our aim is to provide everyone with the opportunity to read each issue and, if so desired, to keep it.

Issued by Technical Secretary, Armament Research Establishment (Ministry of Supply), Fort Halstead, Sevenoaks, Kent.

EDITORIAL AND PERSONAL

This will be the last editorial from our amateurish pen, since through the unaccountable workings of Fate, in the shape of an Appointments Board, we have, like Bully Bottom, been translated.

To leave the Establishment which we entered straight from the University, nearly thirty-two years ago, is more than a slight wrench, and we go with mixed feelings. It is quite true, as Dr. Rotter said in his speech at the Jubilee Dinner, that a family spirit existed in the old R.D. and this inevitably led to an attachment which, in at least our own case, transposed itself to the very different Establishment of post-1939 days.

It was with the idea of fostering this spirit after the dispersals and upheavals of the last War that, in our then capacity as Departmental Information Officer, we conceived the idea of starting a news-sheet, to keep the post-war outstations and the two main stations at Woolwich and Fort Halstead in touch to some extent and to "humanize", as we put it to ourselves, a large and still much-scattered organisation. The immediate causation of the idea was the retirement in 1946 of Dr. R.C. Farmer, who had joined the old "Experimental Establishment" in 1902 as Chief Assistant and Deputy to Dr. Silberrad, the first Superintendent. It seemed that such an occasion should not go unreported, and so, as the first of a series of "News Bulletins", an account of his career and of the farewell presentation to him was published.

After a time, when the Publishing Section had been established and something more ambitious could be attempted, the "A.R.E. Journal" appeared, at first in quarto size under the able editorship of Mr. W.J. Moyce (now of A.W.R.E.) and later in its present form. For the "Journal", as opposed to the "Bulletin", which was a one-man show, an editorial committee had been formed under our chairmanship and we succeeded Mr. Moyce as editor when pressure of new duties prevented him from continuing in office.

Thus for nearly eight years some sort of record of the Establishment's activities, official and domestic, has been kept, and it is our earnest hope that the "Journal" has proved interesting and perhaps helpful to our colleagues; if so, it is ample compensation for the spare-time hours spent on it. The "Journal" has always been indebted to the Chief Superintendents concerned, first Sir William Penney and then Dr. Poole, to whom the editor and committee are duly grateful for support and encouragement.

We also wish to express our thanks to our fellow members of the Editorial Committee; to the many contributors to our pages; to our victims in "Journal Biographies"; to our typing and publishing staff, and to those concerned with the distribution.

We are happy to say that Mr. L.B. Timmis, the Establishment's Scientific Intelligence Officer and Librarian, has expressed his willingness to undertake the editorship, at least for the time being, and are sure that in his hands, the "Journal" will develop and flourish into something really worth while.

Every good wish to you all for the future.

THE JUBILEE DINNER

A memorable year is ended and the A.R.E.'s Golden Jubilee celebrations with it. 1953 will long be remembered as a milestone in the history of the Establishment, and it is our hope that what has been done and said in connection with the Jubilee will go far towards reminding our fellow citizens and tax-payers of what has been done for them in our particular specialized field of endeavour. To this end we enlisted the resources of the Press and the radio, as well as the good offices of a number of distinguished people, who all paid their tribute to our achievements. If we have remained in the background up to now, so far as publicity is concerned, we have at last "had our little say".

The culminating function of the celebration was, of course, the Dinner on 27 November, when, in the sumptuous surroundings of the Goldsmiths' Hall, a company of 160 sat down to enjoy good food, good wine and good fellowship. Dr. Poole, who with Mrs. Poole, received the guests, was in the Chair. The principal guest was the Minister of Supply, the Right Honourable Duncan Sandys, M.P. and the names of the other guests will be seen from the reproduction of the table plan on another page.

It was particularly gratifying to have this opportunity of doing honour not only to high-ranking members of the three Services - our masters in the last analysis - but also to our American, Australian and Canadian friends and to representatives of the wider world of science, with all of whom our links are now so much closer than they were before the last war, to our lasting benefit.

In proposing the toast "The Armament Research Establishment", the Minister opened with a witty reference to his being in the presence of his former bosses, for as a relatively junior officer during the war, he was at the Projectile Development Establishment at Aberporth in connection with trials of "U.P.s" or "Unrotated Projectiles", as the anti-aircraft rocket was known for security purposes in its early days. At those trials, as members of P.D.E. staff, were Sir Alwyn Crow, the Chief Superintendent; Mr. Blackman, who succeeded Sir Alwyn in that post; Dr. Poole and Prof. Rosenhead, all of whom he saw present at the Dinner.

Mr. Sandys said the last 50 years had been notable for an unsurpassed record of achievement, in spite of the fact that the Establishment had been conceived in error - the error being in our munitions in the Boer War, when our shells failed only too frequently to detonate. Not much was thought of scientists by the Services in those days; now, however, science was the king-pin of defence and the Services had long ago recognised the immense contribution that scientists could and did make to their support. He was pleased to think that he himself had been instrumental in having a Scientific Adviser appointed to the Army Council.

The work of the A.R.E. had had far-reaching effects in two World Wars. In the first the Establishment had produced Anatol, and although he thought that the statement by a high authority that "Anatol won the war" was perhaps an exaggeration, it had undoubtedly been a major factor in achieving victory. In the 1939 - 45 war the A.R.E. had given the Services RDX, the incendiary composition SR 365, which was so effective in the guns of our fighters in the Battle of Britain, and the sabot projectile.

In an obvious reference to our three daughter establishments, P.D.E., E.R.D.E. and A.W.R.E., Mr. Sandys said that, like the cuckoo, the A.R.E. had laid eggs in other birds' nests, but this had not altogether been a one-way traffic, for one of those birds had laid at Fort Halstead an egg which had recently broken with a large pop at Woomera. Although he did not bet on football, he would always be willing to back the Penney-Poole combination to win.

He noted that sitting opposite him was another M.P., Sir Waldron Smithers, who had frequently put to him in the House many questions about Fort Halstead and its habits. One of these questions had referred to the expense to the

tax-payer of the widening of the road leading, as Sir Waldron had carefully pointed out, to the "Polhill Arms". He had been equally careful, in his reply, to state that the fact that the private road joined the main road at that well-known hostelry had no significance.

Concluding, the Minister said that the nation depended to-day on the A.R.E. as never before. It had done well in the past and he wished it all good luck for the future.

Responding, Dr. Poole said that it had been decided from the outset that there should be no music to entertain guests at the Dinner - he had been determined that nothing should compete with the blowing of our own trumpets. The A.R.E. had a proud record, but it must always be remembered that a record only set a standard, to be continually surpassed. For the benefit of those present who might enjoy a joke against us he told the story of the civil servant who, during his leave, was assisting a farmer. Set to hoe potatoes, the civil servant worked so assiduously and conscientiously that the field was very soon done, much to the farmer's satisfaction. Thinking that here was a good man, the farmer next took our colleague to a large barn, in which a massive pile of apples lay ready for sorting of the good from the bad. He left our friend to his task, thinking that a troublesome job would soon be finished by such a capable helper. At the end of the morning, coming into the barn to see how things were progressing, the farmer found the civil servant sitting with his head in his hands and a despondent look on his face; by him was a very small pile of good apples and another of bad ones. When the farmer enquired why he had made such little progress the civil servant said that the potato hoeing had been a straightforward job, but with apple sorting there were so many decisions to make that it was quite beyond him. (Wry smiles from the civil servants present; hearty laughter from the other types).

In conclusion, Dr. Poole thanked the Minister for coming and for his tribute to the Establishment, remarking that his presence at the Dinner, was very much appreciated, particularly since what to us was a pleasure must be a burden to one who was obliged to attend so many such functions.

The next toast, "The Services", was proposed by the Chief Scientist, Dr. O.H. Wansbrough-Jones, C.B., O.B.E., who said he had happy memories of the period during which he served with the Army during the last war; they had given him the time of his life. He said the Services provided the reason for the existence of the A.R.E. and indeed of the Ministry itself. In these days, in contradistinction to those of 50 years ago, defence scientists could count on having from the Services the four things they needed - (1) a clear statement of what was required and why it was required; (Dr. Wansbrough-Jones here paid a graceful tribute to the work of Sir Henry Tizard, one of our principal guests and until recently Chairman of the Defence Research Policy Committee, who in that capacity was frequently able to tell the Services what they ought to want); (2) continuity of policy, without which the scientists could not plan effectively; (3) a true understanding of research and of the fact that the country owed more to successful research than to anything else; and (4) friendship. The relations between the Services and the scientists resembled those between the members of a family; they would, and did, argue among themselves, but if anyone else attempted to interfere they instantly became as one. He paid tribute to the enlightened policy of the R.A.F. in supporting the Aeronautical Research Council and to the Navy's own Royal Naval Scientific Service, and was glad to see the Assistant Chief of Naval Staff (Warfare) (Rear Admiral A.R. Podder) and Air Chief Marshal Sir John Whitworth-Jones K.C.B., C.B.E., present that evening, as well as the Deputy Chief of the Imperial General Staff, who was to speak next.

The toast having been drunk, Lt.-Gen. Sir Dudley Ward, K.B.E., C.B., D.S.O., Deputy Chief of the Imperial General Staff, rose to respond with a humorous speech, during the course of which he traced the so-called advance of civilization from the ape and his hand-thrown missiles to

twentieth century man with his atomic bomb. He made a witty reference to radio and other similar scientific devices, which threatened to deprive us entirely of all leisure. Sir Dudley concluded by expressing, on behalf of all three Services, his thanks for what the A.R.E. had done for them.

The toast of "The Guests" was proposed by Mr. Blackman, who referred to the gratification the Establishment felt at being host to representatives of all the British Services and of their Commonwealth and American colleagues, as well as to the Members of Parliament for Woolwich, Sevenoaks and Orpington, and to many distinguished scientists and colleagues from other Establishments. It was also a pleasure to see all four of the Directors of the inter-war years present - Dr. G. Rotter, C.B. C.B.E., G.M. (Explosives); Dr. H. Moore, C.B.E. (Metallurgy); Sir Alwyn Crow, C.B.E. (Ballistics) and Mr. V.F.A. Pullin, C.B.E. (Radiology). The Establishment greatly regretted that Dr. O. Silberrad, the first Superintendent of Chemical Research, (1902 - 06), had been unable, on medical grounds, to be with them, and he read an extract from Dr. Silberrad's letter of apology and good wishes, in which he (Dr. Silberrad) paid tribute to his colleagues of those early days, Dr. Rotter and Dr. Farmer in particular. Fortunately Dr. Rotter had been able to come, but Dr. Farmer, owing to the illness of Mrs. Farmer, had had to decline the warm invitation which was sent to him.

Responding for the guests, Sir Henry Tizard, G.C.B., A.F.C., F.R.S., opened his speech by saying that he felt nervous in the presence of his American fellow guests, since he was doubtful how they would regard one who was wearing a red sash - a remark that drew laughter from all, including the U.S. contingent. Sir Henry then proceeded to reminisce about his early days as a volunteer gunner and then as a member of the Royal Flying Corps. He claimed to have taken part in the first full-scale scientific experiment in the R.F.C. when, following a discussion in the mess after a lecture on the ballistics of bombs, an aircraft was sent up with a cargo of eggs to test the theory advanced by one bright officer that since the resistance to motion increased with increasing speed of fall, eggs would not be broken on reaching the ground if they were dropped from a sufficiently high altitude! The aircraft duly flew across the airfield and released the eggs; the observers on the ground, however, completely failed to find any of them even after a considerable time, and coming to the conclusion that they must still be falling, and being tired of waiting, dispersed again to the mess, quite satisfied with their experiment.

Sir Henry expressed surprise that no mention had been made of Lord Haldane, whom he regarded as the true father of the Establishment, since he always understood that we owed our existence to a conversation between him and Lord Lansdowne, the then Secretary of State for War, in a railway carriage. (We are seeking further information on this point - Ed.).

Continuing, Sir Henry said that if A.R.E. staff should sometimes think they were not putting their talents to good use, they should remind themselves that defence scientists were not wasting their time and skill by undertaking research into armaments; so long as they were helping to produce something, whatever it was, of high quality, so were they adding to the industrial as well as the defensive strength of the country. On behalf of himself and his fellow guests Sir Henry thanked the A.R.E. for its hospitality.

An unexpected, and very welcome, addition to the speeches was made when Dr. Rotter made a few impromptu remarks. In asking him to do so, Dr. Poole mentioned that Dr. Rotter had not thought, until the last moment, that he would be able to be present and said how glad all were that he was, after all, with us.

Dr. Rotter, in reminiscent mood, said it was a great occasion for him, since it was also the 50th anniversary of his appointment to the Chemical Research Department, as we were then called. He felt rather like a grandfather, for in 50 years two generations of A.R.E. scientists had appeared. During the Boer War he, like Sir Henry Tizard, had served as a volunteer

**A.R.E.
GOLDEN JUBILEE DINNER**

SEATING PLAN

[illegible]

gunner in coast defence. In those days they had shells filled with gunpowder with wooden fuzes graduated in half-seconds, the correct setting being achieved by opening up one of a series of holes with a bradawl. With the lyddite shells used in the Boer War it used to be said that the fumes from unexploded fillings tended to be almost more lethal to the enemy than the few flying fragments, so poor was the quality of detonation. The early scientists were regarded with resentment by the military and they would have been looked upon with even less favour if they had come to work in the easy dress of to-day; in fact, attendance at a scientific meeting in London meant morning coat and top hat. The strength of the old R.D. was the family spirit it possessed and it was a misfortune when the Department had to be scattered in the early days of the last war. The Establishment of to-day was, however, fortunate in having a chief like Dr. Poole to knit the many branches of specialists together again.

Dr. Rotter returned to his seat amidst acclamation and so ended a memorable evening, which will last long in the memory of all those present.

We were fortunate in being able to acquire such a dignified Hall for our Celebration Dinner and our thanks are due to the Prime Warden and the Wardens of the Goldsmiths' Company for their ready acquiescence in the request, sponsored by Dr. Wansbrough-Jones, who is himself a Liveryman of the Goldsmiths' Company, that we might be allowed the use of it - a privilege not lightly granted. The Chief Scientist's interest in our plans, and his active encouragement to us to make the function worthy of the occasion, are much appreciated and it is a pleasure to have this opportunity of adding our thanks to those already expressed to Dr. Wansbrough-Jones, on behalf of us all, by Dr. Poole, who himself found the time to act as Chairman of the Jubilee Committee, which met altogether nine times to formulate plans for the Dinner and the Social. The execution of the details was left as the responsibility of the writer, who promptly delegated the multifarious arrangements to Mr. E.A. Barker, of his staff. Rarely has the principle "if you delegate, delegate thoroughly - and don't interfere" been so well justified by results, and it is a pleasure, as well as a duty, to make public acknowledgement of Mr. Barker's services - we all owe him a large debt of gratitude for his work, which involved the sacrifice of many hours of leisure. He is understood to feel relieved that he is unlikely to be available for the celebration of our hundredth anniversary.

Thanks are also due to the Publishing Section which, under Mr. Hampshire's able guidance, produced the Menu Card, and its associated seating plan, in a manner fully worthy of the occasion. This was no mean feat considering that we do not possess enough type to print a document of that length in one operation. The inevitable last-minute alterations added to the difficulties and that all these were so successfully overcome is a tribute to the Section's resourcefulness, ingenuity and skill.

THE JUBILEE SOCIAL

The first function in celebration of the Golden Jubilee of the Armament Research Establishment took the form of a Social and Dance on the evening of 30 October 1953, at the Town Hall, Woolwich. The Chief Superintendent was present with Mrs. Poole, together with about 400 people who well represented all Branches and grades within the Establishment, and their friends. About 100 of these came from the none-too-accessible regions around the Fort, and some, of course, from E.R.D.E. We were glad to see a few former members of the staff, and one or two visitors from D.W.R.(D) and Headquarters Sections.

Naturally enough, in such a mixed programme, the principal feature was the dancing. The music was provided by the Royal Artillery Dance Orchestra, who fully lived up to their very high reputation. Their presence added also a pleasant sense of our close connection with the Services. The

numbers dancing may have meant that the floor was a little too crowded for the full satisfaction of the experts, but they also mercifully hid the efforts of the few who, like the writer, have but little acquaintance with the ballroom. The dances were well chosen for such a thoroughly mixed gathering.

Parlour games on the grand scale are bound to be difficult to run successfully, but the only one (really two in one) actually attempted was finished smoothly enough, although it could have meant very little to those not actually taking part.

If the mean free path of the human dipoles was short, they still had reasonably long lives before becoming re-ionised; but the balloons projected in a shower from the balcony had much shorter shrift, and all were quickly transformed into rapidly degraded quanta of acoustic energy - plus a few limp fission products. Many of these reactions were no doubt thermally induced - with cigarette ends.

Quite the least satisfactory feature of the evening was the excessively high noise level from the bar, where quantities of well-known liquids containing volatile solvents were decanted into thermally insulated receptacles kept at 37°C. It was nobody's fault that so large a bar space opened so completely on to the main hall; but when the polite requests of the M.C. completely failed to produce any perceptible reduction in the noise, while an entertainment was in progress on the stage, then at least some of the more privileged guests were inclined to comment unfavourably. One could only ascribe it to Jubilation!

The Orchestra contributed three solo items, on the pianoforte, xylophone, and post horn; but only the last succeeded in competing with the background (like John Peel's "View Halloo!", it "Would awaken the dead"), and provided a rousing and attractive number.

The A.R.E. Dramatic Society also had organised an entertainment, consisting of a number of highly topical items written by some of the real wits of the Establishment. The opening Tableau, called "Security", revealed some unexpected bathing belles who looked far from secure, being Restricted only by limited paper work without even any red tape. "The Superintendents' Song" was so Secret that no information is available for publication. A sandwich-man, seemingly lost, wandered into view at intervals displaying such seasonable advertisements as "Patronise Poole's Pantry". "Up your Straight" struck many familiar notes, and was an mildly satirical representation of a broadcast visitation by commentators from both B.B.C. and N.B.C., those of the latter, of course, being relayed for the benefit of his fellow-citizens of the U.S.A., complete with interpolated advertisements. (Owing to a technical hitch, the B.B.C. had to do this all over again later at Fort Halstead ... Ed.). "Progress without Planning", described as "A Fantasy of A.R.E., Past, Present and Future", was presented in three scenes, dated 1903, 1953, and 2003. The first two bore remarkable resemblances to fact. We hope the last one did (or is it "will") not. The principal connecting link appeared to be St. Barbara, said to be the patron saint of artillerymen. (Had she been cleared by Security?) She seemed to be curiously absent, however from the middle scene!

The last item, described in song (to the well-known tune), the histories of "Three Little Maids from School" who joined the staff of the A.R.E. They clearly started out with very proper Planning, and made steady Progress. In the last verse but one, they had all married P.S.O's and the like; and in the last verse had contrived somehow that their "worn and weary" husbands, who had "toiled through the long years dull and dreary, Superintendents soon will be" - obviously more romantic than true to life.

While this obviously did not claim to be a polished, serious performance, it was a pity that so much amusing nonsense, with a lot of time, thought and effort of many people behind it, just did not get a fair hearing.

The Compere, who had quite a powerful voice, succeeded in telling

a number of funny stories. One, about a party of stragglers in the desert, revolved round a cookery recipe which certainly owed nothing to Mrs. Beeton. (It is understood that the narrator had inside knowledge derived from his association with the Directorate of Catering Inspection, Kamelbrooke).

There was some disappointment that this Social and Dance had no evident connection with the Golden Jubilee of the Establishment. This deficiency would undoubtedly have been fully corrected had the Chief Superintendent been able to make a short speech, as (it is understood) he had intended, and which he had actually prepared; but he unfortunately decided that even he might not get a hearing.

However, it is fair to say that the evening was a success, and hopes were voiced that something similar might become a more regular feature of post-war A.R.E. life. "A good time was had by all", complete with Jubilation.

Those who had no private transport were looked after by the Get-you-home 'bus service which was provided. Some even finished the evening with a sort of Mystery Tour of the Kent borderlands!

Our thanks are due to the Committee, the M.C. and his untiring assistants, and all those who contributed to our entertainment, for their hard work on our behalf.

J.W.A.

JUBILEE PUBLICITY

Through the good offices of the Chief Information Officer of the Ministry the degree of publicity given by the local papers to the Establishment on the occasion of its Golden Jubilee was quite considerable, although, through no fault of his, the amount of space given to us by the national papers was a little disappointing.

A week or two before the Dinner the Ministry issued a "press release" to the newspaper world; this was based on a document prepared in the Establishment and is reproduced below. At the same time, representatives of leading newspapers, the Press Association, the B.B.C. and the Editor of "Nature" were invited to the Dinner with the result that what had been released was supplemented in some cases by what was said in the speeches.

Then on 24 November, after these contacts had been established, Mr. Ivor Jones of the B.B.C., and two engineers, visited Fort Halstead and recorded various items and a statement by Dr. Poole. The result was broadcast in "Radio Newsreel" the next day and again on the Sunday following; the script of this is also reproduced in this issue. We understand that another visit may follow and there is just a possibility of a TV recording later on.

What was particularly gratifying was the suggestion of the Editor of "Nature" which has a very wide circulation among scientists all over the world, that the A.R.E. should provide an article of about 2,000 words for his journal. This was duly submitted and - in anticipation of cuts - was of considerably greater length than that suggested. Nevertheless, it was accepted in toto and appeared in the issue of "Nature" dated 12 December 1953. It is too long to reproduce here but can be seen in the Library by anyone who is interested.

We thought this would be the last of our public appearances, so to speak, but this was not to be so, for we afterwards received a request from the Army magazine, "Soldier", for material for an article, with the result that on 14 December Mr. Groves, the magazine's feature-writer and Mr. Stirling, their photographer, visited Fort Halstead, and two days later, Woolwich. It is understood that they were greatly interested and that their editor hopes to publish an article about us in the February 1954 issue.

The Service Correspondent of the "Daily Telegraph", Mr. Leonard Bertin has also visited us to gather material.

All this should go far to putting us "on the map" and establishing our rightful position in the world of defence research, both atomic and "conventional".

THE PRESS RELEASE

Celebrating its 50th birthday this month is one of Britain's first "back rooms" - the Armament Research Establishment of the Ministry of Supply.

Today it is part of the largest scientific organisation in the Commonwealth, the great network of defence programme research centres operated by the Ministry of Supply. But in 1903 when the A.R.E. was founded, with a staff of half-a-dozen, it was the only scientific establishment at work on the Services' armament problems.

From that small group has grown, within the past 50 years, the vast organisation ranging from atom stations to centres which test soldiers' boots, equipped with many millions of pounds' worth of apparatus and employing an army of research workers, which serves the Services today.

Shells Fizzled Out

The Armament Research Establishment was formed after public outcry during the Boer War over the faulty ammunition used by our troops in South Africa. During that campaign, British artillerymen found that their shells only too often fizzled out miserably without exploding. Propellant explosives - those which send the bullet from the cartridge - were also highly unsatisfactory.

To examine the problem, a Government committee, consisting of some of the most eminent scientists of the day, was set up. As the result of its recommendations, the Chemical Research Department, as the A.R.E. was first called, was born, laboratories being built on a site at Woolwich Arsenal.

These were ready in 1903 and the staff, the first "boffins" ever, moved in to start work on the mammoth task of overhauling Service munitions.

In the following years, the establishment grew slowly until it numbered some 20 scientists. In this pioneer period it expanded to take in work on metallurgy and ballistics and laid the foundations of modern armaments design. Few modern explosives processes do not employ devices which originated at Woolwich in the early days of the A.R.E.

"Amatol Won the War"

The outbreak of the 1914-18 war found Britain hopelessly unprepared. Due to a shortage of acetone, an essential component, only enough cordite to meet the Navy's demands could be manufactured. As for high-explosive, supplies of lyddite - the HE used in the Boer War - were hopelessly outpaced by demand and TNT, only recently adopted by the Services, had hardly emerged from the laboratory stage.

The small staff at Woolwich, hastily augmented as the war developed, grappled with the problems with the urgency the situation demanded. First, they solved the cordite problem by developing a type in which a mixture of ether and alcohol replaced acetone. This was used by the Army throughout the War.

TNT production was a graver problem. The Establishment's scientists scoured the junk yards of Woolwich to build a pilot plant for a manufacturing process of their own invention. This produced some three tons of TNT each week and so grave was the shortage that lorries queued to carry away even this small quantity to the hungry munitions factories.

Factories were speedily built to manufacture TNT by the new process and large numbers of the Woolwich staff left to take charge of munitions plants all over the country.

As the war progressed, however, even the increased supplies of TNT could not meet the unprecedented demand. Possibly the biggest triumph of the Woolwich "boffins" was the development of amatol, an explosive which economised TNT by diluting it with up to four times its weight of cheap ammonium nitrate, with little loss of effectiveness.

"Amatol won the War," said the Director of Artillery in 1918.

Hardly less valuable was the other work carried out by the Woolwich staff - increased during the war to 1,260 scientists and ancillaries - in other fields. Fuzes for cutting barbed wire entanglements, star shells, smoke bombs and signal flares were only a few of the new types of munitions born at Woolwich during the war years.

Post-War-Pre-War

After 1918 the Establishment was largely engaged on settling problems thrown up by war-time experience.

One of the most serious was the "decay" of cordite in storage, through impurities in its components, which had caused several serious explosions in magazines and battleships, including the loss of HMS Bulwark in 1917.

Research at the Establishment resulted in a new type of cordite which remained stable after long periods in store. Flash-less cordites were also developed and economy in manufacture was achieved by the use of wood, instead of cotton, cellulose.

The Battle of Jutland had shown the need for a shell which would not explode on impact, but which would penetrate armour and detonate inside a ship. For this, the staff at Woolwich developed a new explosive "Shellite", and produced a special delay fuze for use with it.

The War had also shown the need for a more powerful explosive than any hitherto known. Several hundred possible compounds were exhaustively examined at Woolwich during the 'twenties and 'thirties and, finally, the explosive now known as RDX was selected. Work was then concentrated on the development of a safe and economic manufacturing process. The experimental plant set up at Woolwich served as a model for the factories producing RDX throughout the Second World War.

RDX was mixed with TNT or aluminium or both for use in torpedoes and aircraft bombs. It also formed the base of a plastic explosive which could be moulded to railway lines, girders and similar structures for maximum cutting effect. This was widely used by saboteurs in the occupied countries in the last war.

Research on steels was carried out to meet the demands of mechanised warfare. Ballistics experts at Woolwich worked on new mathematical theories which enabled full use to be made of improvements in propellants and design of guns and also on other developments which were of considerable importance in later years, such as the catapult launching of aircraft and devices for starting aircraft engines. New types of signal flares and other "fireworks" were developed so that Britain led the world in this sphere. From 1935 onwards, the establishment carried out the pioneer researches into rocketry, which led to the formation in 1939 of a new centre, the Projectile Development Establishment, to develop these ideas into the rocket weapons which were so effective on the Anzio beaches and in the Falaise Gap.

Radiography, the X-raying of metals to discover internal flaws, also developed at Woolwich during the inter-war period and became standard procedure for the inspection of armaments.

World War II

Thanks largely to the establishment's work between 1918 and 1939, Britain's position when World War II broke out was immeasurably better than in 1914.

The immediate problem in the early days of the war was not so much the demand for new types of munitions as shortage of supplies. The Establishment therefore concentrated on the task of bringing scientific knowledge to bear on production difficulties.

As the strategy of the war changed, however, new munitions were required. The vital role played by fighter aircraft, for example, demanded a new type of ammunition.

A variety of types was quickly produced by the establishment, the most important being the incendiary filling SR 365, a mixture containing aluminium and magnesium. This, used in the guns of the Hurricanes and Spitfires, was decisive in the Battle of Britain. It has not yet been superseded.

As the fighting man's equipment became increasingly complicated a corresponding range of ammunition was required. More than a dozen different types of small arms weapons exist today, for example, needing a range of ammunition including ball, armour-piercing, high explosive, incendiary and tracer types.

The campaigns in France, Flanders and, later in Libya showed the urgent need for a means of penetrating heavy tank-armour. This led to one of the most important developments of the entire war - hollow-charge projectiles, based on the fact that greater penetration of armour is achieved by the forward blast of explosive hollowed out to a cone shape.

The first hollow-charge weapon used by any belligerent during the war was the No. 68 grenade, based on the establishment's work. This principle was also used in the PIAT, and its German and U.S. equivalents, the Panzerfaust and the Bazooka.

The hollow-charge principle is an outstanding advance in armament design, the full scope of which has probably not yet been completely realised.

Another most important war-time development was the production of the Sabot projectile. In this missile a light metal carrier holds a small, very dense and very hard core. The carrier is discarded when the shot leaves the muzzle and the energy of a large gun is concentrated into a small bullet which is thereby enabled to penetrate much thicker armour. This development came just in time to play a valuable and extensive role in the Normandy campaign, giving our 6-pounder guns the equivalent striking power of much larger calibres.

Bombs for the R.A.F. were also the subject of intensive research by the establishment. At the beginning of the war, our air bombs were mostly of the "general purpose" type, which had a medium thick wall and medium size explosive charge. When large-scale bombing of Germany began, however, the need for a bomb giving maximum blast effect on buildings was apparent. To meet this, very large bombs with light casing and the maximum quantity of HE were necessary and the Establishment played a major part in their development.

The Establishment was also responsible for the powerful filling used in the "earthquake" bombs, the 22,000 pounders.

The mixing of aluminium and high explosive produced the "Minols" range of explosives, used largely for bomb filling, while "Torpex", a mixture of RDX and TNT with aluminium, was introduced for torpedoes and special bombs. "Torpex" was the explosive which breached the Ruhr dams and, in a modified version, secured success in attacks on the Tirpitz.

This work and a multitude of other tasks went on despite the handicaps of frequent moves - at one time the establishment was split into 33 stations all over the U.K. - and the considerable organisation problems produced by the enormous increase in staff, from just over 1,000 in 1939 to just under 3,000 in 1942.

First Atom Bomb

Shortly after the war, the Establishment, now stationed at Fort Halstead, embarked on the biggest and most important project of its entire history. It was entrusted with the development of Britain's first atomic bomb.

Under Dr. (now Sir) William Penney, appointed Chief Superintendent in 1946, more than half the staff were concentrated on this one all-important task. Finally, as the project grew to a scale which demanded its own separate establishment, the A.R.E. gave its Chief Superintendent and a large number of its most experienced men to form a new organisation, known first as "High Explosives Research" and later as the Atomic Weapons Research Establishment. Under its present Chief Superintendent, Dr. H.J. Poole, it is now again devoting all its energies to the improvement of less spectacular but nevertheless essential weapons.

The Monte Bello explosion ended a chapter in the history of British armaments research, a chapter which began during the Boer War. Born when total war was born, in the last campaign entrusted entirely to the professional soldier and the first in which modern high explosives were used, the Armament Research Establishment has throughout its 50-year lifetime played a leading part in protecting Britain from threats unimaginable before this tragic century. In the years that lie ahead the skill and experience of its scientists will remain one of our strongest bulwarks against aggression.

THE A.R.E. ON "RADIO NEWSREEL"

The B.B.C. has kindly allowed us to reproduce below the script of the broadcasts in "Radio Newsreel" on 25 and 29 November 1953. Apart from its contents, it is interesting to note how, in the hands of an experienced broadcaster, what looks quite banal on paper can make an interesting talk - the difference between the spoken and the written work; and how great it is!

Extract from Radio Newsreel Light Programme. 25 November, 1953

NARRATOR: During the South African War, about fifty years ago, reports kept coming back to this country saying that too many of the shells which were being sent out as ammunition for the British guns, were failing to explode. As a result a few experts at Woolwich were told to investigate. That was the beginning of the Armament Research Establishment - a body which is now celebrating its fiftieth anniversary. It has its main headquarters to-day at Fort Halstead, near Sevenoaks in Kent, and it was here that our reporter, Ivor Jones, saw some of the work that's being done.

JONES: There isn't a fighting unit in the British services that hasn't been able to hit harder because of the Establishment's work. At the end of the last war it started designing the most terrifying of all explosives - atomic weapons. These it later handed over to another Ministry of Supply organisation, and once again it's concerned with less spectacular things. They're spectacular enough, though. Even the routine work in the laboratories produces curious sounds that few people ever hear. Here's the noise of a steel rod being stretched until it breaks. The Establishment's always testing metals for gun barrels and so on.

ACTUALITY

Another way of testing metals - in fact, of analysing them - is by vaporising them in an electric arc. Here it is being switched on. (ACTUALITY) And then there's the high speed wind tunnel. One of the few in the world where the design of shells and rockets is tried out in air that's rushing along at four times the speed of sound, the equivalent of 3,000 miles an hour. When it's at work, the whole of the building housing it seems to throb and vibrate. (ACTUALITY - WIND TUNNEL). Incidentally, the Establishment's planning an even bigger and faster wind tunnel.

Then there's the hydro-ballistic tank, used for research into what projectiles do when they're fired from air into water, say, from a ship or aircraft against a submarine; quite a different problem from firing in air. It's a glass-sided tank, forty feet long and ten feet deep, and filled with water. Shells are fired into it from a two-pounder gun, and this strange noise is heard when it's being prepared for an experiment. (ACTUALITY). The tank is the only one of its kind in Britain. Soon, too, the establishment's going to have a computer, with a better memory than any other in this country. In fact, it will have two memories - a rapid one and a slow one. But even the slow memory will be able to recall in a thirtieth of a second any one of 15,000 numbers, each ten figures long. The computer will cost £100,000 and have 3,600 valves, and a building's already been put up to house it.

I was able to ask the Chief Superintendent, Dr. H.J. Poole, about the work the Establishment's now doing.

POOLE: You will realise that this work is mostly highly secret, and that I cannot tell you very much. I can, however, say that we are working on the business end of guided missiles, on new and better ways of attacking armour, on making our guns hit harder and faster and more accurately, and at the same time to last longer. Our Services are small. It is highly necessary, therefore, that they should be the best equipped in the world. This is our aim and that of our associated establishments. I think that some of the new things now coming along will have as large an impact on our future security as anything that has appeared so far.

AN INTERESTING LUNCH DATE

Following correspondence about our early history, your Editor was invited to have lunch and a chat with Dr. Silberrad, our first Superintendent of Chemical Research (1902-06) at his home, Dryads' Hall, Loughton, Essex, on 17 October last.

On arrival we were ushered into Dr. Silberrad's study, a large room lined to the ceiling with books and containing relics of his association with the A.R.E.'s early days. We found our host sitting at a large and handsome desk, on which were laid out in readiness a number of photographs of the original laboratories, the magazine, the refrigeration chamber and so on, of the old Chemical Research Department. These photographs were afterwards kindly lent to us for copying for our records, and one is reproduced on the cover of this issue.

Although he was unable to walk without the aid of crutches, owing to an attack of thrombosis earlier in the year, Dr. Silberrad's mind was obviously still keen and alert and we had a most interesting talk before he led the way round his well-equipped laboratory, adjoining. In this he employed 14 assistants at one period, but now to his great regret, he cannot carry on his consulting work.

We then proceeded to the drawing room, overlooking the lawn and Epping Forest, where Mrs. Silberrad and their son were waiting to welcome us with sherry and cocktails. After an excellent lunch, Dr. Silberrad, in reminiscent mood over the coffee and liqueurs, related how in his student days in Germany, he was the ringleader in an escapade whereby a sentry was nailed up in his box, much to the annoyance of the C.O. of the regiment

concerned, who demanded of the Principal of the University that the culprit should be sent to him for punishment. Our host related that he went in much trepidation, to find a bristling Colonel awaiting him. After a stern tirade, the officer ordered young Silberrad to go into the next room, which he started to do with grave misgivings, wondering what grim punishment awaited him. On opening the door, however, he was astounded and relieved to find a tea-table ready laid and the Colonel's wife and daughter waiting to welcome him - so even pre-war German officers were sometimes human.

Further anecdotes included a lively account of how he got through the German customs with some confidential documents entrusted to him by the Hungarian Government and by him in turn to the concealment afforded by Mrs. Silberrad's underwear.

Then it was 3 o'clock and time to take our leave of this hospitable family, whose last act of kindness was to instruct their chauffeur to convey their visitor to a point several miles away, so that he could conveniently visit some relatives.

It was quite clear, after meeting this distinguished-looking scientist now, though then only in his early twenties, he had been able to build up and direct so efficiently the embryonic A.R.E. of fifty years before.

Let us hope that he will soon make a complete recovery from his disability.

Amendments to "GENESIS"
(A.R.E. Journal, November 1953, No. 14, p.1)

We are indebted to Dr. Silberrad for the information that the Chemist who lost an eye in the explosion in the laboratory on 14 April 1904 was Mr. Phillips, and not Mr. Merriman. Although the statement in the "Journal" article was based on the official report of the Court of Inquiry into the incident, it was apparently not thought necessary to issue an amendment when Dr. Silberrad drew attention to the error at the time.

We take this opportunity of amplifying another statement in our article. The reference to Dr. R.C. Farmer might not have made it clear that he was appointed on 1 September 1902, as Chief Assistant and Deputy to Dr. Silberrad. When Dr. Silberrad resigned, Dr. Farmer became acting Superintendent of Chemical Research until the appointment of Dr. Robertson to the vacancy. Thereafter, until 1915, when he was transferred to the Department of Explosives Supply, under Lord Moulton, and was succeeded by Dr. Rotter, Dr. Farmer was deputy to Dr. Robertson.

It also seems that Dr. Robertson did not long have the title of "Assistant Superintendent Chemical Research" but became known as "Superintending Chemist" very soon after his appointment.

THE "A.W.R.E. NEWS"

It is with pleasure - and dare we say it? - with fatherly interest, that we note that our youngest daughter establishment now produces a magazine of her own, the first issue of which appeared in November last.

We wish the venture every success and congratulate the A.W.R.E. Editorial Committee on its excellent format - real print, an' all!

S.T.A. TENTH ANNIVERSARY

In September 1943 a Branch for Theoretical Research was set up within the Armament Research Establishment. The celebration, regrettably but unavoidably belated, of its Tenth Anniversary took place on Friday, 11 December 1953, and was attended by a gathering of past and present members, led by Professor Mott, the first S.T.A., and Dr. Maccoll, who followed Professor Mott as S.T.A. and is now S.S.A.M., the old Theoretical Research Branch having by now expanded into a complete Applied Mathematics Division.

The morning and afternoon were devoted to a symposium held in the Hydroballistic Tank Theatre. In its early days the old S.T.A. Branch would hardly have credited that it, or at least the Division into which it has grown, would one day possess its own theatre! After coffee and gossip Mr. Thornhill, as Chairman, opened the symposium. The programme, divided by lunch and tea into three sessions, was

Dr. J.W. Maccoll, S.S.A.M., on "S.T.A.: Past, present and future".

Mr. A.H. Armstrong on "Drag coefficients in streamline flow".

Professor D.C. Pack, Royal Technical College, Glasgow, on
"The drag of finite wedges at near sonic speeds".

Dr. M. Holt on "A vortical singularity in conical flow".

Film: Penetration effects of bullets.

Film: Trials at Suffield Experimental Station, Alberta, Canada.

Mr. G.J. Laing, S.E.M.P., Foulness, on "Analysis of results of
Suffield trials".

Mr. C.K. Thornhill on "The diffraction of a shock of moderate
strength around a right-angled corner".

Professor L. Howarth, Bristol University, on "Three-dimensional
effects in boundary layers".

Dr. Maccoll, in his opening paper, first gave a brief résumé of the valuable work done in the earlier, particularly wartime, years of S.T.A. He pointed out that a number of the bright young mathematicians of those days had now become distinguished figures in the academic world. But he acknowledged that it was not in mathematics alone that the younger members of S.T.A. showed their ability, instancing the case of one who, on duty in Germany, managed to set up a most luxurious establishment complete with butler! Dr. Maccoll then described the changes after the war, the expansion of S.T.A. into the Applied Mathematics Division with a Wind Tunnel, a Hydroballistic Tank and a Cavitation Tunnel, and the work being carried on at present. Finally he spoke of plans for the future and made it clear that S.T.A.'s high standard would be kept up not only by S.T.A. itself but by the whole of S.S.A.M.

The other items on the programme of the Symposium were more technical and specialised. In keeping, however, with the nature of the occasion as a celebration, the proceedings were kept light-hearted and informal by Chairman, speakers and audience alike.

In the evening a dinner was held at the Amherst Arms, Riverhead, at which Dr. Maccoll presided as Chairman. The company of thirty-six consisted mostly of past and present members of S.T.A., of all grades and degrees of importance from Professor Mott and Dr. Maccoll down to past and present Scientific Assistants. But it also included, to its great pleasure, Sir John Lennard-Jones, Dr. Poole, Brigadier Hinds, Dr. Simmons, Mr. Blackman and Mr. Grew, all of whom have been, through their position or their work, so closely connected with S.T.A. as to be considered for the occasion as honorary members.

The dinner was timed for half-past seven but many people had little to do after the Symposium finished and the company had therefore started to gather in the bar of the Linhurst Arms by six o'clock. After an hour and a half of drinking and gossiping, during which time the bar became fuller and fuller and past, present and honorary members of S.T.A. gradually swamped all other patrons, when dinner was served the company was in an extremely good state for appreciating excellent food and more wine, though its capacity for talking appeared to remain unimpaired.

When dinner was finished port was served and the company, by then in very mellow mood, settled down to enjoy the speeches. The formal toast list was

The Queen

S.T.A.

Proposed by Professor N.F. Mott
Reply: Mr. C.K. Thornhill

A.R.E.

Proposed by Professor Sir John Lennard-Jones
Reply: Dr. H.J. Poole, C.S.A.R.

The Ladies

Proposed by Mr. E. Dearden
Reply: Miss K.M. Stocks

Professor Mott described the beginnings of S.T.A. which, since its formation entailed the combination of various groups from different places, were not without difficulties. Mr. Thornhill, in reply, also spoke of S.T.A.'s early days and told a delightful story about Professor Mott. During a small conference Professor Mott kept tilting his chair back and back so that eventually the legs slipped and he descended backwards on to the floor. There was dead silence until he had picked himself up, when he glared round and said "All right, gentlemen, you may laugh!"

Sir John Lennard-Jones spoke of his early days as Chief Superintendent of Armament Research when he was trying to convince higher authority that a Theoretical Branch would add to the efficiency of the A.R.D. (as it was then). Apparently authority had no faith in mathematicians, but, naturally, Sir John had his way in the end. Dr. Poole, in reply, spoke of S.T.A. in relation to the rest of A.R.E. S.T.A. now feels justified in assuming that it has proved to be a "good thing".

Mr. Dearden was asked to propose the toast of "The Ladies" because of his long experience of S.T.A.'s "Ladies". He justified the choice by producing one or two scandalous stories of early days, including that of the young lady who took a bath in a developing dish - needless to say, he knew of this exploit only by hearsay! In spite of such occasional unconventional behaviour, however, he acknowledged that the ladies of the Branch had their uses and paid tribute to them as tea-makers and party-organizers. Miss Stocks, in her reply, described herself as a sort of Branch Mother and therefore a most suitable person to speak for the ladies. The unconventional behaviour mentioned by Mr. Dearden was before her time. Her "little girls", though not, perhaps, quite reaching the standard of glamour considered desirable by certain senior members of S.T.A., were charming, efficient and, as Mr. Dearden appreciated, most useful "about the house".

After the formal toasts the Chairman called on Mr. Hicks and Dr. Corner to say a few words. Though they were unprepared for this, both of them most politely - and most convincingly - said that they were glad of the opportunity to pay tribute to the excellent work done by S.T.A. in the past and to wish it success in the future. Finally, Dr. Poole was reminded by Mr. Dearden's and Miss Stocks's remarks about tea-making of a story about two lions who escaped from the Zoo. One had a poor time - nothing to eat. The other got into a block of Government Offices and for some time lived well on a Civil Servant a day. No one bothered about his activities until he made the mistake of eating the girl who made the tea. It became quite obvious to him then that he could no longer stay there, and the two lions met on their way back to the Zoo.

The party then reluctantly broke up, leaving the organizers of the day's celebration exhausted but satisfied that it had been most successful.

CHANGE OF ADDRESS

We had intended to cease recording these but could not refrain from publishing the one below, which was received from the IPCS, of all people, and was sent to us by the addressee:-

Miss M. I. Philpotts,
Nursery Supply,
A.R.E. S.M.R.,
Woolwich S.E.18.

All attempts to extract information from Miss Philpotts as to exactly what she supplies to nurseries, have so far failed.

KEEP IT DARK

We have a little Cupid working in the A.R.E.,
I'd suspected it for ages, and I saw him recently,
He was lurking in a corner, hidden underneath a chair,
And I'm sure the Superintendent does not know that he is there.

He works in the Ballistics Branch, which causes no surprise,
For Ballistics Branch romances have shown a steady rise;
He selects a likely couple at whom to shoot his darts,
And his aim is very skilful, so he often hits their hearts.

At first we see them "walking out", and guess where they are heading,
Then very soon they get engaged, and next there is a wedding,
Then Cupid chuckles gaily at the triumph of his art,
And looks around to find another target for his dart.

I wonder how he got inside the Arsenal at all,
He has no yellow pass to show, but then, he's very small,
So perhaps he crept in after dark, or hid inside a car,
Or possibly he bribed the police - you know what Cupids are!

I hope I have not scared him off, for you will all agree,
There is still a lot of work for him within the A.R.E.;
Just in case he reads this 'Journal', I would rather like to say,
That he can safely trust me not to give his game away.

M.E.P.

THE A.R.E. DRAMATIC SOCIETY

What, in the writer's own opinion, is the greatest success the Dramatic Society has so far achieved, was its seventh production, "Bonaventure", on 19 and 20 November last.

This play, by Charlotte Hastings, deals with the tense situations to be expected when a girl artist, whose appeal against conviction for the murder of her brother has just been dismissed, is marooned in an isolated convent hospital during a flood while on her way back to jail with her wardress.

Another conviction, that of Sister Mary Bonaventure of the hospital, that the girl is innocent, and the way in which she is ultimately able to prove this, and unmask the real murderer, the doctor, form the basis of the play, and both Marjorie Harding as the nun and Dawn Colling as Sarat, the condemned girl, held the audience, one at least of whom had seen the play in London, gripped to the end.

All the other parts were well played too, and it was a great pity that the audience on both evenings was so scanty: such a production deserved better support.

May this inadequate notice of an excellent performance lead next time to an audience worthy of the fare the Society provides.

The cast was as follows:-

Nurse Philips	DORIS TAYLOR
Nurse Brent	EILEEN O'MAHONY
Sister Josephine	IRENE PHILPOTTS
Willy Pentridge	PETER LAYTON
Sister Mary Bonaventure	MARJORIE HARDING
Doctor Jeffreys	PHILIP HULATT
The Mother Superior	PAMELA STULL
Melling	DAVID PICKMAN
Sarat Carn	DAWN COLLING
Miss Pierce	JOYCE JONES
Martha Pentridge	MICKIE HULATT

As on previous occasions, the set was constructed by members of the Society. The play was directed and produced by Basil McNulty.

J.S.G.

GREATER LONDON FUND FOR THE BLIND

The following contributions from A.R.E. and A.W.R.E. have been handed to the Fund's collectors:

9 November 1953	£9 1s. 9d.
25 March 1954	£13 11s. 2d.

GALLANTRY RECOGNIZED

Early in 1953 an explosion of shell occurred in the Arsenal, near Crossness, and left a legacy of ammunition in a dangerous state, as well as causing fatal casualties.

Among the people who had to deal with the debris, with a view to ascertaining the cause of the disaster and determining how best to dispose of the unexploded rounds, were five members of our staff, Mr. W.A. BAILEY, Dr. F.E. BALL and Mr. T.H. QUARRY of the scientific staff, and Messrs. A.A.H.W. GASTON and E.C. WILSON of the ancillary staff, whose gallantry was recognized when they received the Queen's Commendation for Brave Conduct in November last.

Reproduced below are a letter from P.D.S.R.(D) to Dr. Poole and a covering letter with which Dr. Poole sent a copy of P.D.S.R.(D)'s letter to each recipient of the award.

From: Dr. W. Cawood, C.B.E.,
PRINCIPAL DIRECTOR OF SCIENTIFIC RESEARCH (DEFENCE),
SHELL MEX HOUSE,
STRAND, W.C.2.

25 November 1953

PERSONAL

My Dear Poole,

May I say how very glad I am that your staff have been honoured by five Queen's Commendations in recognition of the hazardous work undertaken and successfully completed after the fatal accident at Woolwich last February.

I think, of course, that this episode reflects the greatest credit on the whole of the Establishment and it is, indeed, very fitting that the Establishment should be so honoured in this its Jubilee Year.

Both General Eldridge and myself would like you to pass on our congratulations to the officers concerned.

Yours very sincerely,

(Sgnd.) D. Cawood

Dr. H.J. Poole, C.B.E.,
C.S.A.R.,
Main Building (4th Gate),
Woolwich Arsenal, S.E.18.

From: Dr. H.J. Poole, C.B.E.,
Chief Superintendent.

HQ 27/24

2 December 1953

Dear

I should like you to see the attached copy of a letter from the Principal Director of Scientific Research (Defence) and I would like to add my own personal congratulations.

This is just one example of the unflinching devotion to duty that is shown by our staff whenever an emergency call arises, and I am very proud that it has been officially recognized at last.

With very best wishes,
Yours sincerely,

(Sgnd.) H.J. Poole

We add our own congratulations to our colleagues, on behalf of all the staff.

CONGRATULATIONS

To Miss J.M. RICHARDS and Mr. T.E.L. LUMLEY (both of S.B.R's Branch) on obtaining the Degree of B.Sc. (Gen.); to Mr. M. HILL (also of S.B.R's Branch) and Mr. C.V. HURDLE (of S.S.A.M's Division) on obtaining B.Sc. (Special) Degrees in Mathematics and Physics respectively; and to Mr. S.A. TAYLOR and Mr. E. WILLIAMS of A.R.E. Drawing Office on their election as Graduates of the Institution of Mechanical Engineers.

To Professor SIR JOHN LENNARD-JONES, K.B.E., F.R.S., the first Chief Superintendent Armament Research (1942) and now Principal of the University College, Keele, Staffordshire, on the award of the Davy Medal of the Royal Society.

To Professor N.F. MOTT, F.R.S., the first Superintendent of Theoretical Research in Armaments, on his election to the Cavendish Chair of Experimental Physics at Cambridge; also for the award to him of the Royal Medal of the Royal Society.

To Mr. C.G. DRAKE (Fort Halstead) on receiving an award for a suggestion for the revision of the Security Questionnaire and to Mr. H.M. KENNEDY, (Tandu) on receiving a similar award in connection with a Dead Load Indicator.

To Miss M.W. BONCEY and Mr. H.J. YALLOP on having pictures hung in the Bromley Art Society's Sixth Annual Exhibition in December. Mrs. EILEEN HADEN, wife of Mr. H.O. Haden, Fort Halstead, also exhibited.

Mr. E. MULCAHY I.S.M.

We congratulate Mr. Mulcahy on the award of the Imperial Service Medal, which was presented to him by C.S.A.R. on 3 December 1953, in the presence of many of his colleagues.

After service as a gunner in the R.G.A. from 1907 until after the Great War Mr. Mulcahy was a civilian valet to the cadet officers at the Royal Military Academy for 20 years. During the last war he was with Army Medical Stores and then an Examiner with C.I.A. He joined the A.R.E. in 1947 as Labourer I and at the time of his discharge from established service on reaching the age of 65 in 1953 was a Lab. Worker "C". He re-engaged in a temporary capacity the day after.

For most of his time with us he had been working for E.R.D.E., first in the Materials Section and later in the Climatic House, where he still serves.

Mr. PERCY SMITH I.S.M.

Mr. Smith, Laboratory Worker "C", Leading Hand, in the Proof and Experimental Establishment, who retired in September, also received the Medal, but since he did not wish to attend a formal presentation it was sent to him by post.

We congratulate Mr. Smith and wish him a long and happy retirement.

Mr. FRED HARGREAVES I.S.M.

Mr. Fred Hargreaves, R. & E. Mechanic (S) employed by A.R.E. at Ruddington was awarded the Imperial Service Medal.

The medal was presented to him by Mr. C.G. Pollitt, representing Dr. H.J. Poole, C.S.A.R. on 22 December 1953. A number of Mr. Hargreaves's colleagues were present.

Mr. A.W. COCK I.S.M.

Mr. Cook, Technical Grade III in charge of the Carpenters' shop, Woolwich retired in September 1953, and was awarded the Imperial Service Medal. An account of his long service with the Establishment appeared as "Journal Biographies - No. 6" in the April, 1954 issue of the Journal.

Mr. W.L. ANGELL I.S.M.

Mr. Angell, Storeman I, was awarded the Imperial Service Medal when he had completed nearly 35 years in government civilian service after nearly 12 years in the Royal West Kent regiment.

Dr. Poole presented the medals to Mr. Cook and Mr. Angell at Woolwich on 17 February 1954, in the presence of a large number of their colleagues.

RETIREMENTS

Mr. E. GARRATT

Mr. E. Garratt, Principal Scientific Officer, retired on 20 October on reaching the age limit, after 38 years of service. At his particular request the date of his actual retirement was kept secret, known only to a few who were directly concerned, and it was also his desire that no announcement should appear in the "Journal". He has, however, given us permission to include this short statement so that our records shall be as complete as possible.

No ban, however, will prevent his friends from wishing him a long and happy retirement.

Mr. F. HOLDEN, M.A.

Mr. Frank Holden, Principal Scientific Officer, and Safety Officer to the Establishment, retired on 31 December 1953 after nearly 33 years' service. Mr. Holden was born in 1893 at Barnoldswick in Yorkshire. After attending schools at Southport and Nelson in Lancashire, he entered St. John's College Cambridge, in 1911. He left Cambridge in 1915 with Second Class Honours in Parts 1 and 2 of the Natural Sciences Tripos and joined a team of chemists, mostly from Birmingham, Oxford and Cambridge Universities, recruited by Messrs. Chance and Hunt Limited, to staff the T.N.T. factory which was being erected by them at Oldbury. This factory was later called H.M. Factory, Oldbury, and at the close of the 1914-18 War was producing 500 tons a week. The process installed at Oldbury was based on research rapidly carried out in the Research Department, Woolwich, and a member of the Department, Dr. G.E. Mott was appointed Chief Chemist. Mr. Holden can thus claim to have been, in a sense, an "R.D." man from the start of his career.

After a period as shift chemist he was transferred to research work on the Holley - Mott continuous counter-current nitration process and was associated with that process throughout its development and installation at Oldbury.

In October 1918 he went to the Cooper Laboratory at Watford in charge of the Photographic Chemicals Section, but did not remain there long, for September 1919 saw him as Chief Lecturer, and afterwards Head of the Chemistry Department at Rutherford Technical College, Newcastle-on-Tyne.

After two years of teaching he was unable to resist the appeal of an advertisement which offered him the prospect of taking up again plant-scale research practically at the point at which he had left it at Oldbury, and in June 1921 he joined the Research Department, Woolwich as Head of the Factory Section of the Explosives Directorate with the rank of Assistant I (old style). He became Head of Branch in May 1932.

During this period the process of manufacture of picrite was developed from the laboratory to the factory scale and the semi-technical investigation of the manufacture of RDX started.

In December 1932 Mr. Holden was attached to the General Explosives Staff on the Directorate and for three years was responsible for dealing with enquiries on technical problems in this field. Then, when the A.R.P. Section of the R.D. was formed to carry out investigations for the Home Office on defence against incendiary attack, he was placed in charge. His work in this Section included an extensive series of large scale experiments on the use of chemical and air foam for the extinction of fires in oil storage tanks, on the use of baffles for the recovery of burning oil and on fire-resisting oil booms in harbours. The results obtained were used by the Admiralty and the Petroleum Board as a basis for the design of new oil storage depots. In addition to all this work on the protection of buildings against incendiary bombs, from 1940 onwards the A.R.P. Section also dealt with the chemical aspects of methods of dealing with unexploded enemy bombs.

Mr. Holden's next move took place in February 1943, when he became Head of the Foreign Munitions Section of the Applied Explosives Branch. This Section was formed to centralize the work on the examination of enemy munitions and on allied problems, which had hitherto been distributed among a number of sections of the A.R.D. At the end of the war the Section had a staff of 13 scientists, all busily engaged on dissecting and examining the many types of enemy munitions which fell into our hands, and it is a tribute to Mr. Holden's experience and careful guidance that no accidents occurred during the course of this hazardous work.

During the war Mr. Holden was the Establishment's representative on the Incendiary Bombs Committee and the Oil Depots Committee of the Home Office and the Ministry of Home Security. He was a member of the Unexploded Bomb Committee of the Scientific Advisory Council throughout its life and was Chairman of the Incendiary Bombs Tests Panel of the Ministry of Home Security and Ministry of Aircraft Production. For some time he was a member of the Technical Advisory Panel of the Petroleum Warfare Department.

After the war, in January 1946, Mr. Holden was appointed Departmental Safety Officer, a post which he held until his retirement. In this, he was responsible for advising all Branches on safety measures.

Mr. Holden's wide experience and sound advice will be greatly missed and it is a matter of great regret to all his colleagues that he elected to retire just after reaching his 60th birthday. He has, however, taken the sensible step of retiring while still young enough to enjoy his leisure to the full. He hopes to spend much of it in studying economics and the early history of music, interests which have attracted him for some years. He has stated that he has no agricultural ambitions on any scale whatever, and that the only garden he is likely to be found cultivating has the very urban address of Bow Street, W.C.2.

We all wish him every happiness for the future and hope that he will visit us from time to time. His private address is - Leven House, The Meadway, Heath Lane, S.E.3.

Mr. R.A. WOOLLVEN, A.R.C.S.

Mr. Rolfe Armstrong Woollven, Senior Experimental Officer in SAE's Branch at Fort Halstead, retired on 31 October 1953, after 34 years' service, at the age of 65. Mr. Woollven was born at Sutton, Surrey, in June 1888, and was educated at Dulwich College (Engineering side). On leaving school he was apprenticed to Messrs. Duke and Ockendon, Water Engineers, Littlehampton, and after serving his time with this firm, became Assistant to Professor A.K. Huntington, at King's College, in the Strand. In this capacity, in addition to assisting Professor Huntington in researches concerned first with metallurgy and then with explosives, he acted as demonstrator to second-year students in the Mechanical Engineering and Electrical Engineering faculties.

In September 1919, Woollven entered the Research Department and was attached to the Physics Section. The connection was broken, however, for the academic year 1923-4 when he was given leave of absence to complete his course for the Associateship of the Royal College of Science; he became A.R.C.S. in 1924, no mean feat at the age of 36.

It was in that year that his association with the Hopkinson Pressure Bar which was to continue for the rest of his professional career, began. The Pressure Bar is used for measuring the pressure developed by explosives and detonators and seldom can what is, in essence, only a cylindrical rod of steel have had such a faithful acolyte; it may almost be said that the Pressure Bar and Woollven are synonymous terms. When in the '20s and '30s he was sometimes obliged to leave his laboratory to assist with bomb trials at Shoeburyness, it was obviously to his great sorrow that no Pressure Bar big enough to cope with a 2,000-lb. bomb was developed and such was his enthusiasm that he almost succeeded in convincing his colleagues that without the Bar the last two wars would have been irretrievably lost: with the result that they view with some apprehension the country's prospects should another war break out with Mr. Woollven no longer there.

This light-hearted banter, in the vein to which he is so accustomed, must not be allowed to obscure, however, the effective contributions which he made, through the agency of his favourite instrument, to our knowledge of explosive processes, nor the improvements in the design of the pressure bar itself, which he realized from the earliest days could be a potent aid in explosives research, as indeed he made it.

Woollven was a valued member of the Pressure Bar Committee and of the Proof Yard Working Party set up to help the Inspection Departments, who have been concerned with installing the equipment in their own organisation.

Mr. Woollven has always had many hobbies, among which motoring, mechanics, electricity, radio, photography, scouting and camping, Esperanto and the study of paranormal phenomena are all numbered. He is now adding gardening to the list, in anticipation of retiring to a cottage in the country. He prides himself on having, so far, successfully avoided matrimony.

Those who have had the privilege of association with Mr. Woollven deeply appreciate his unfailing good humour - never lessened however much his leg was pulled - and his unvarying courtesy to all with whom he came into contact. He is regarded with real affection by his colleagues and will be greatly missed from the Fort. Our best wishes for a long and happy retirement follow him.

At a farewell ceremony in the Fort Halstead Canteen on 29 October, which was attended by a large number of Mr. Woollven's colleagues, Mr. Highfield, Senior Superintendent of Applied Research, after conveying apologies from the Chief Superintendent for inability to attend, paid tribute to Mr. Woollven's work and to his invariably friendly attitude to his fellows.

Mr. P. Bessent referred to Mr. Woollven's successes with the Pressure Bar, and mentioned that as late as 1953 he had developed a new method of using the instrument; this was likely to be adopted.

In lighter vein, he referred to Mr. Woollven's prowess in nursing old cars and to his life-long advocacy of the metric system as a means of measurement, which in the past had led to much head-scratching in the carpenters' and machine shops. Mr. Bessent conveyed the good wishes of his Chorley section to Mr. Woollven and added his own appreciation of the pleasant relations which had always existed between Mr. Woollven and his colleagues.

Mr. A. Warren, now Superintendent of Explosive Munitions Performance, on whose staff Mr. Woollven had worked in earlier days, also paid tribute to him.

Mr. Highfield then asked Mr. Woollven to accept a cheque and an autograph book, subscribed for by his many friends as tokens of remembrance.

In reply, Mr. Woollven thanked the speakers for their tributes and all concerned for their gifts. He made generous acknowledgment of the efforts of his staff and hoped he would be able to come back from time to time to see all his friends.

ENGAGEMENT

BRENCHLEY - DAY

In December 1953, Eric George Brenchley of S.E.W's Branch to Pamela Ann Day of the Reports Section, A.R.E.

BIRTHS

LONERAGAN

On 14 March 1953 to Winifred, wife of Ronald J. Loncragan of SMR's Branch, a daughter (Christine).

BIRTHS (Contd.)

EDWARDS

On 20 July 1953, to Jean, wife of Mr. P.A. Edwards of SBR's Branch, a son (Martin Peter James).

LONGHURST

On 6 October 1953, to Marjorie, wife of Dr. E.E. Longhurst of SBR's Branch, a daughter (Vivienne Glenys).

MARRIAGE

GOLDHAWK - BARNES

On 20 December 1953, Stanley Goldhawk to Rita M. Barnes of SBR's Branch.

OBITUARY

MR. K.A. EVES

It is with great regret that we record the death on 9 November 1953, of Mr. K.A. Eves, Assistant (Scientific) in S.A.F.'s Fort Halstead Section. Mr. Eves had been away from duty for some time suffering from a rare and unfortunately incurable disease.

Our deepest sympathy is extended to his wife and family.

MR. PATRICK FITZSIMMONS

It is with great regret that we record the death of Mr. Fitzsimmons, Laboratory Worker 'C' in the Proof and Experimental Establishment, Woolwich on 1 January 1954, aged 63 years.

Mr. Fitzsimmons joined P & E.E. Woolwich after having served as a Gunner in the Royal Artillery for a number of years. He was employed, first as a Labourer, then as a Laboratory Worker, in the Magazine Section, where he counted among his friends many who were, like himself, ex-gunnery.

He died in the Southern Hospital, Dartford, after a fairly short but painful illness, and he will be sadly missed by all with whom he came into contact.