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REVIEW



1956-7

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No. 18

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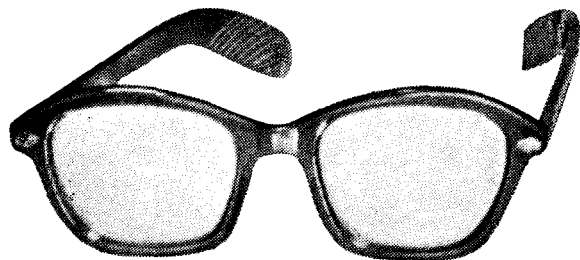
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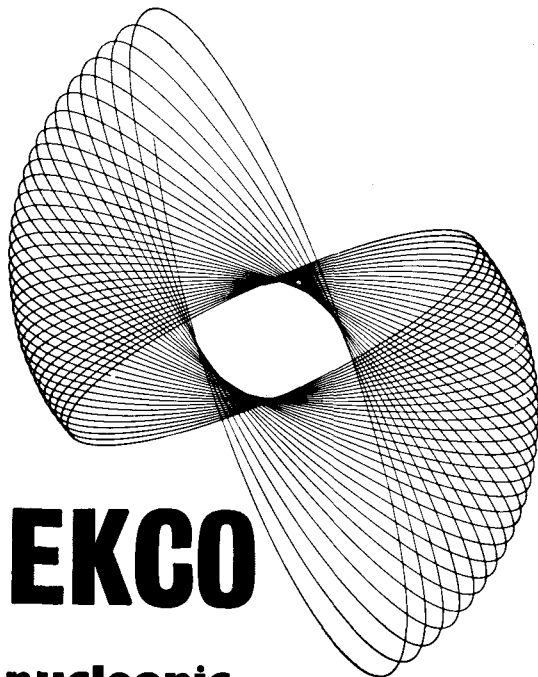
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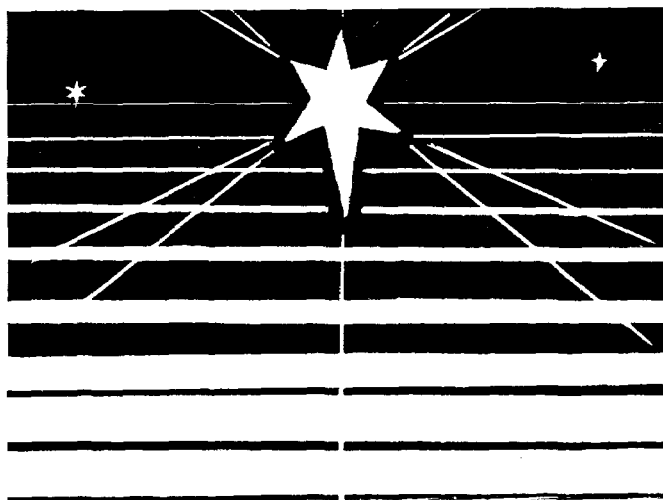
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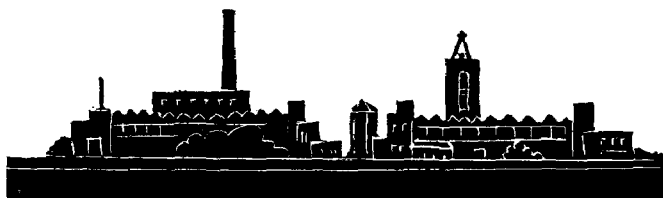
FOREWORD

THE frontiers of Man's knowledge lie always shrouded in the dawn mists, and the wonders dimly visible are just not capable of description in the language of the day. Had Faraday seen through a veil the turbo-alternators of a modern power station, its switchgear and its meters, he might have sensed something of their meaning but he could no more have described them than we can describe the structure of the atom. We see or we think we see, but we have to wait for confirmation till the dawn of one generation becomes the high noon of the next. And if anything is certain in Man's unending quest for knowledge, it is that noon will succeed sunrise, and day follow day till perhaps in God's good time we may know the secret of it all. For the Atom is scarcely a beginning, let alone the end. It is new and it is frightening, but so too, in the World's short history were fire and gunpowder. That Man's spiritual self will grow in pace with, and keep control of, his vast technical progress is not in doubt—not at least to those who, knowing something of the Universal pattern from the Atom to the Milky Way, find in that knowledge a belief that it was not created merely to be blown up.

Where the Atom and beyond is concerned we are still in the misty dawn of knowledge, and our greatest scientists know that their definitions are only assumptions—that they are trying to write, in the inadequate language of 1956, the drama of 2000. It seems to me that you of Harwell have an especially significant part in that essay. Your work, by its very nature does not remain unsung in contemporary chronicles—but surely you are writing another story, in a language becoming the less inadequate as your frontiers expand.

H. G. PUTTICK.

(Mr. H. G. Puttick is Technical Director of Pethow Limited, who have supplied us with electric generating plant. They are one of the many concerns who, in small ways and large, are co-operating with the U.K.A.E.A.).



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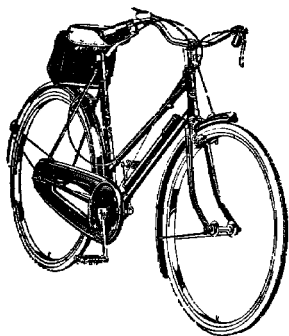
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EDITORIAL

The recent visit by Her Majesty the Queen to the nearby towns of Abingdon and Wallingford for the Centenary Celebrations was a worthy occasion. Against a leaden sky the gay standards and coats of arms made a brave showing and not for many years has either Abingdon or Wallingford known such a day. Although Her Majesty came near to us, it is easy to see that not even a quick tour of the Establishment could have been fitted into a day that was devoted principally to the ancient tradition that is the heritage of all of us. We hope, however, that Her Majesty will one day visit Harwell.

Already nuclear power is serving a small part of the country's industrial and domestic needs. From Calder Hall on the 17th October, 1956, The Queen switched nuclear power into the National Grid for the first time—but Calder is only a beginning. We are told that, if the nation is to maintain its industrial development, then within the next 20 years there must be a trebling of electrical power available. Already from the experience gained in the building of the first full-scale atomic-powered generating station at Calder Hall the exploitation of nuclear power for civil needs becomes almost a matter of comparative costs and dates. Referring to this rapid development of the nuclear power industry, the Director has said: "The nuclear power stations of 1970 will look as different from those of 1957 as the modern motor car differs from the Model T. Ford".

The Establishment's contribution to future power needs by research on reactors and the growing benefits to medicine, industry and agriculture conferred by the rapidly expanding applications of radioisotopes is important, but no less important is the training given at the Isotope and Reactor Schools to students from industry and universities at home and overseas. The Reactor school was quite recently moved to a new building which has enabled the number of students attending the school to be doubled. These 'international schools' show in practice the continuing spirit of the Geneva Conference which is described in our leading article.

At this time we convey all good wishes to our growing community of readers. To those associated with us in private industry and elsewhere, and particularly to those who have come to Harwell from overseas, we extend special greetings.

During our life-time the atom, which formerly symbolised *infinitesimal size*, has come to mean *gigantic power*. We pray that the atom will be used not as a *disintegrating power*—through the destruction of lives and of the spiritual and material treasures of civilization—but as an *integrating power*—bringing together the peoples of the world in a common bond of research and mutual help.

D.A.T.

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THE STORY OF CERN

EUROPEAN
ORGANIZATION
FOR
NUCLEAR RESEARCH

By J. B. ADAMS
Quai de l'Ecole de Médecine
Geneva.



Photo CERN

IN the years that followed the last war, physicists engaged in re-establishing teaching and research in their own countries often discussed the possibility of setting up a central laboratory for high energy physics research which would offer to young European scientists facilities similar to those of the big American laboratories of Berkeley and Brookhaven. Unfortunately, the machines at Berkeley and Brookhaven are very expensive, and in most of the European countries it was evident that the cost of a worth-while high energy physics laboratory was too high a proportion of the national budget for all physics research for any single country to consider building such a laboratory. In proposing a collaboration of European countries, it was hoped that enough money would be found to build, not only machines similar to those at the American laboratories, but machines of even higher energies, and a laboratory equipped with such machines would enable more European physicists to contribute to the researches and discoveries in this field of physics.

It was clear that a European laboratory for

nuclear research, however appealing it might be to the scientists, could only be realized as the result of action taken by the Governments of the various countries. One important question in the minds of the scientists who talked over these problems was how to go about interesting Governments in such an idea, and how to bring about meetings of sympathetic people likely to influence Government decisions. UNESCO helped a great deal with these early problems, and it was through UNESCO that the first official approaches were made to the European Governments.

Unofficially, the scientists themselves enlisted the aid of those of their friends that had direct access to influential government scientific bodies such as the DSIR in Great Britain. Both approaches gave encouraging results and, by the well known methods of international meetings and private lobbying, the concept of a European laboratory progressed from a pipe dream to many Government papers in a surprisingly short time. In 1952, about two years after the original discussions amongst the scientists, several small groups of

people working in their universities and institutes all over Europe were considering the design of accelerating machines that could be built in such a laboratory. It was finally decided to build two machines, a synchrocyclotron to accelerate protons to 600 million electron volts and a very large synchrotron to accelerate protons to 25,000 million electron volts. At the end of 1953, about fifteen of the senior physicists and engineers that had been working on the design of the larger machine moved to Geneva, which by this time had been chosen as the location of the laboratory, and set up the first CERN laboratory at the Institute of Physics of the University of Geneva. This move, although essential for the design of the machine, was somewhat premature since CERN (the name given to the new laboratory) was not officially recognized by the Governments and funds were only available for meetings, not for design work or for paying salaries.

It was not long before the small group demanded apparatus and tools. Some of this apparatus was borrowed from the physics laboratories of the European Universities and from Government Establishments. The three Harwellians who formed part of this early group raised very interesting problems for the Customs Officers at London Airport by insisting on transporting two large wooden packing cases filled with tools and apparatus "borrowed" from Harwell as part of their personal luggage. The British Government scientific bodies, including Harwell, were particularly helpful, although at that time Britain was not a member of the interim body of CERN. In October 1954, the Governments of twelve European countries signed the document that brought CERN into a legitimate existence. By then nearly thirty physicists and engineers were at work in wooden barracks erected as temporary laboratories near the Institute of Physics in Geneva.

CERN is organized on much the same lines as any other research laboratory. There are two divisions engaged on the design and construction of the two accelerating machines, a

division supervising the erection of the buildings on the site, the site maintenance and transport, a division mainly concerned with experimental apparatus and common scientific facilities such as an electronic computer and the liquid gas plants, a theoretical division and finally an administration division. The total staff numbers about 400 at present and will reach its maximum number of 500-600 next year. Outside the local CERN organization is the European Government representation which takes the form of a Council composed of two members from each of the twelve countries, usually a scientist and a non-scientist, the latter being either a diplomat or a civil servant concerned with the administration of the national scientific bodies. Sir John Cockcroft and Sir Ben Lockspeiser are the Council Members for Britain, Prof. Francis Perrin and Mr. J. de Bourbon-Busset for France, Prof. W. Heisenberg and Dr. A. Hocker for Germany. The Council meets twice a year and has two advisory committees, the Finance Committee and the Scientific Policy Committee which meet several times a year to approve the budgets and the more important contracts of CERN and the overall scientific policy respectively.

This very brief description of the establishment of CERN is probably enough to give Harwellians a general idea of the type of organization that has been set up in Geneva to carry out high energy physics research on a European scale. There are no security restrictions: all the researches are published and are available to anybody.

Perhaps it will be of interest to give a few details of a more personal nature about CERN. The division in which I work is concerned with the design and construction of the large synchrotron. The staff comes from all over Europe: from Belgium, Britain, Denmark, France, Germany, Greece, Italy, Netherlands, Norway, Sweden, Switzerland and Yugoslavia. The official languages are French and English, but all European languages are used and the *lingua franca* is broken English. The general

scientific level is reasonably good simply because the countries have sent some of their best people to work with CERN. CERN is young and relatively small, and the pioneering days are not yet over. Those of you that took part in the setting up of the radar establishments during the war, or in the early days of Harwell, will know the fresh spirit that permeates such young organizations.

The staff lives in and around Geneva, mostly in flats. The salaries, taking into account the high cost of living in Geneva, are comparable with those at Harwell and, once the language difficulties have been overcome, the standard of living of the British staff is similar to that of their corresponding grades at AERE. Geneva offers slightly more exciting relaxations than, say, Abingdon. The lake is definitely more pleasant for swimming in and sailing on than the Thames. The local mountains are snow-covered in winter and many of the staff ski. The accident rate for CERN staff rises sharply in winter due to broken legs. There are plenty of first-rate concerts and good theatrical performances. Guaranteed sunshine can be ensured for the summer holidays by going down to the Côte d'Azur, which is only a day's journey from Geneva. In general Geneva is a pleasant place in which to work and play and the staff pursue both activities with equal enthusiasm.

Having painted the good side of CERN life, it is only fair to mention the ways in which the life is more rigorous than at Harwell. All the CERN staff have only three year contracts with no guarantee of renewal. Only recently have we set up some measure of health insurance, but it is not complete as the British National Health Scheme. School fees for the children of the staff are very high compared with those in Britain, even though CERN gives some assistance in this respect. The risks for a family man are higher than at Harwell, but CERN is benevolent, and in many instances has most generously helped the staff when in difficulties. Looking around at the people who have found it worth while to join CERN, which in many cases has meant their giving up secure jobs in their own countries, I find that CERN has managed to attract the

REVIEW



Proton Synchrotron

Photo CERN

sort of people that one would like to see in a research establishment.

Visitors, particularly from Britain, often ask if such an international staff work well together. We have found that only the usual difficulties associated with team work have arisen and that national differences are negligible. For one thing, nearly all of us are foreigners. I have learned that the temperamental characteristics popularly ascribed to different nationals are small compared with the variations between people from any one country. An excitable Welshman is just as unpredictable as an excitable Italian. The language difficulties tend to help human relationships, replacing to some extent the old principle of counting up to ten before speaking when angry. Visitors react to CERN in many ways. There are the dewy eyed who see in CERN all sorts of promise for European collaboration, forgetting that what CERN is doing is outside the interests of the well-known politicians. CERN has been able to begin without raising important political questions. There are the cynics who predict that the early enthusiasm will soon die and that CERN will degenerate into a sort of

miniature League of Nations. Whatever outside influences affect the future of CERN, much depends on how well it succeeds in the next few years. Already it has some sort of scientific reputation, as was shown at a conference organized by CERN in June this year, to which about 300 scientists came from all over the world to discuss the problems of accelerating machines and high energy nuclear physics. Among these scientists were seventy Russians and an equal number of Americans. But conferences are not enough. All international organizations have conferences; CERN has got to build machines and use them for nuclear physics research. It must

continue to attract good physicists not because of the pleasant living conditions or high salaries, but because it offers good research facilities and has built up a high level of technical and scientific competence. We have a long way to go before reaching such high standards as those of the American and Russian laboratories and, like any other laboratory, CERN must expect all sorts of difficulties in the next few years; but if it does establish itself as one of the world centres for high energy nuclear research, it will in a small way help to re-establish the position that Europe held for so long in the field of scientific research.

★★★



At this year's British Industries Fair. Dr. Shonland, Deputy Director, explains the 1/24th scale model of DIDO Site to H.M. the Queen. The Duke of Edinburgh has just turned from the 1/12th scale model of the Reactor.

★

Opposite

An apprentice, of whom there are 123 in various parts of Harwell, works on the model of "Swimming Pool" Reactor, LIDO. Interest was shown in this model by the Russian leaders who came to Harwell in 1956. In the same year the model was also admired by H.M. the Queen at the B.I.F. Exhibition and by H.R.H. Princess Margaret on the occasion of her visit to the Establishment.

Other People's Jobs

By D. A. TYLER

No. 4. THE WOODWORKING SECTION
HG.9.



IF you put your head round the door at the west end of Hangar 9, you would be immediately convinced that this is no ordinary shop engaged in humdrum carpentry. Inside, an operator might be seen sculpturing the figure of a man from a block of wood, while another carves out the shape of a motor-car. A second glance would reveal their purpose as comparisons of size for the larger, much more complicated models that stand around in the course of construction.

Originally, the Woodworking Section had the function of providing equipment for the workshops, laboratories and general services of Harwell. This included the supply of equipment for Britain's first atomic pile, and it was of G.L.E.E.P. that the first model was made. It was exhibited at the 1949 British Industries Fair and was followed by a model of B.E.P.O. which was shown at the Festival of Britain

and at a later B.I.F. exhibition. Both models, together with other equipment from Harwell, are to be seen today at the Science Museum, South Kensington.

At one time model-making was regarded as just one of the many wood-working jobs demanded of the Section by the fast-developing site. The value of models is such, however, that their construction has become an increasing responsibility of the Section and its most important service.

Space prevents illustrating even a representative selection of models here, but more photographs will appear to illustrate technical articles in the next issue, when also "George", the mechanical man, will deserve special mention. All the models shown on these pages—including the large ones have since appeared at several exhibitions in various parts of Europe.



TECHNICAL NOTES

At bottom right a model of PLUTO is shown on view at the recent Vienna Trade Fair. This reactor will be used for testing the effects of nuclear radiations on materials, especially those proposed for new reactor systems. Basically, it is the same design as DIDO, the model of which the Director is seen showing to the Prime Minister and withdrawing the core.

PLUTO is cooled by heavy water which also acts as a moderator, slowing down the neutrons to the right speed, and about ten tons is pumped round a continuous circuit containing a heat exchanger in which ordinary water (light water) extracts the heat.

As in DIDO, the fuel elements are made of enriched uranium alloy that contains more U235, the fissile uranium isotope, than natural uranium. Rod shaped and encased in aluminium, they are suspended in an aluminium tank containing heavy water with helium gas at the top to prevent entry of air. Around this tank is a graphite reflector to reduce the neutron loss and outside this is a reinforced concrete shield to give protection from radiation.

PLUTO is controlled by means of cadmium plated steel arms working like railway signals. Shut-off rods of the same material can be dropped straight down into the reactor, while air pressure inside the round steel housing is just less than that outside so that, if there were contamination, it would not spread outwards.

The shell of the reactor is now to be seen on the Harwell horizon—seventy feet in width and seventy feet in height. PLUTO will be completed by 1957 and in service by 1958.

★

The model left is of DIDO, the most powerful experimental reactor in Western Europe, that started operating on the 7th of November. The last fuel element was inserted by the Director at ten minutes past two in the morning and DIDO is now ready for the testing of materials and the making of powerful radioactive isotopes.

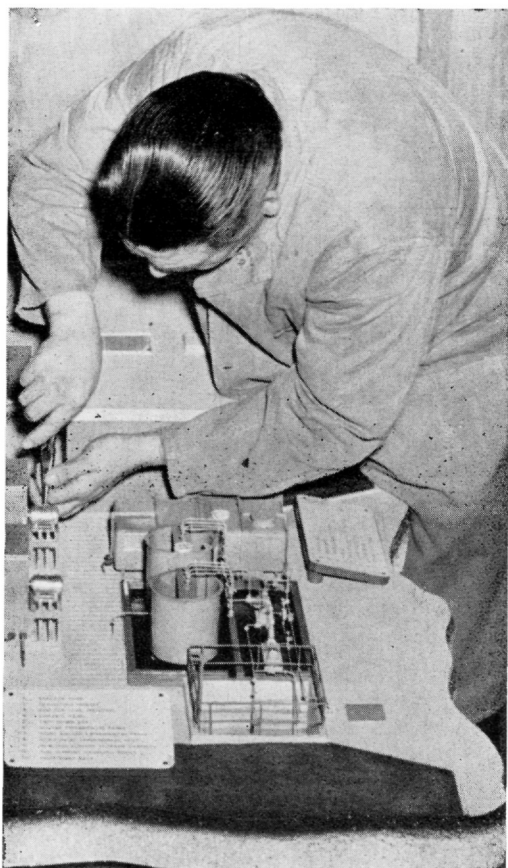
A factor which has to be considered, particularly in the case of these larger models, is the need for easy dismantling. Various means, including air transport, can then be used for their dispatch to distant exhibitions.

The value of such models to our external relations, both at home and abroad, will easily be recognised, but other advantages may also be derived *before* their being put on exhibition. When a structure is first built accurately to scale, the need for alterations sometimes becomes apparent. Modifications can then be made to the design prior to much more expensive construction at life size—when an *academic* Reactor may be transformed into a *practical* Reactor! Guidance from the models is also derived in planning the sequence of building operations and they are also used for instructional purposes.

At the time of writing this, the Section was to be seen producing the complete Isotopes Exhibition Stand for the Vienna Trade Fair, 1956. They comprised two revolving models: one of the new 10,000 curie Active Cell that is capable, amongst other things, of food processing; the other an adapted model of PLUTO Reactor. There were also several Animated Panel Stands for the exhibition of Isotopes, all of which were constructed in contemporary design.

Although model-making brings increased interest and satisfaction to the Woodworking Section, one finds, on visiting the shop, an almost breathless tension. Unforeseen difficulties may sometimes cause late delivery of a Dry Box to its Harwell group and *may* not evoke strong comment. But the target date for completion of an exhibit *must* be according to schedule, for with the age-long tradition of all showmen—be it at Harwell, Olympia or Geneva—"The Show Must Go On!"

★ ★ ★



AT WORK ON THE MODEL OF LIDO

(Below) Part of our contribution to the 64th Vienna Trade Fair at which there were 1,490 exhibitors from 17 countries.



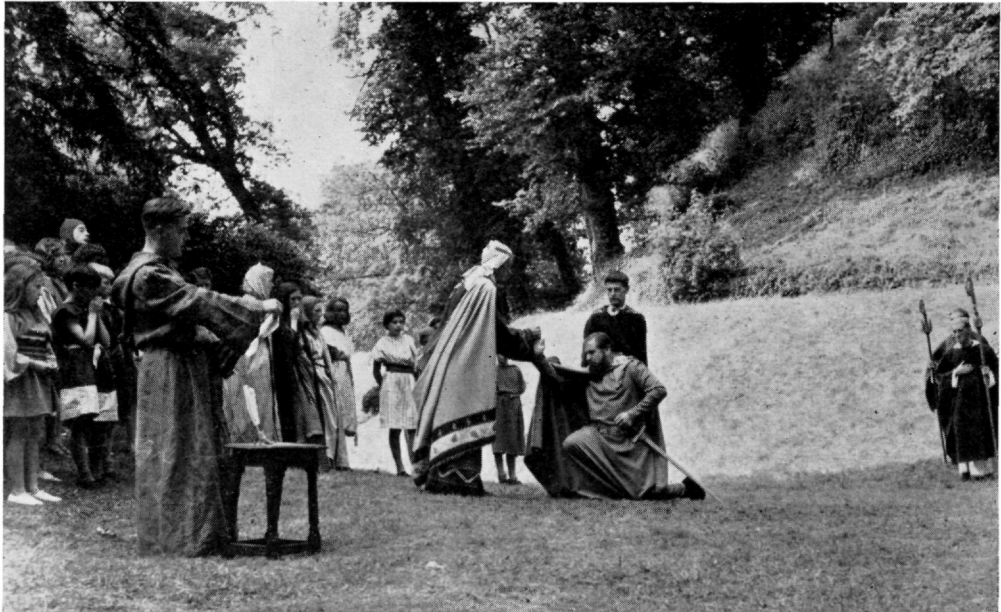
THE A.E.R.E. DRAMATIC SOCIETY PRESENTS

YES, the Dramatic Society is still an active body, which, in spite of all the difficulties it has faced, has increased with the years since its formation at the end of 1946. This year's pulling down of the Gymnasium-theatre was viewed with mixed feeling: with regret at losing this reminder of associations; and with hope that new and better accommodation would quickly be placed at the Society's disposal. For recent productions, however, the hall of Chilton School has had to be hired; and in spite of the very shallow stage and rudimentary facilities, not to mention the cost and the restrictions attendant on working in a place that is not one's own, some very creditable shows have been performed.

During the summer, a play was presented at Didcot Church Fete and members of the Society have held play readings in the Social Club and in the houses of individual members. Readings have included "Thun-

der Rock", "Twelfth Night", "Juno and the Paycock" and "Figure of Fun". At the time of writing, plans are afoot for another production at Chilton School; it is probably going to be 'On Monday Next', a most entertaining piece which shows, without too much exaggeration, what a production looks like a few days before Opening Night—the theatre with the lid off, so to speak! This play would certainly be a good choice for any drama group working under difficult conditions, as the problems of scenery and "dressing the set" are simple, while the play itself is good fun.

If, later in the season, use can be had of better accommodation, such as the large room downstairs in the Social Club, the Society thinks it might be worthwhile staging something more ambitious than it has done of late—a costume play, perhaps. Some of us will recall the excellence of "Pride and Prejudice", so here's hoping they pull it off!



Flash-Back. During Festival Year A.E.R.E. Dramatic Society combined with two other groups, and a cast of 150, in an historical masque in the grounds of Wallingford Castle. The setting near the keep of the castle was perfect, the only indication that it was taking place in the 20th century being the large audience—about 100 attended one performance.

All groups took part in the final episode, the signing of Wallingford's Charter in 1155 and the A.E.R.E. Dramatic Society was responsible for King Stephen's peace treaty with Henry, Duke of Normandy, in 1154.

In the shadowed keep of Wallingford Castle, with the ruins peeping between the trees, the most matter-of-fact mind was sent fancifully back down the centuries.



WALLINGFORD

The 1956 Royal tour of North Berkshire will long be remembered. At every crossroad and at nearly every bend of the route people gathered to see her—people on horseback, farmers and their men on tractors and carts, old and young turned out to see their Queen.

At Wallingford, the Civic Party and all the burgesses who had lined the streets became anxious as the hour for the queen's arrival passed without her appearance. The continued slowing of the cars caused a delay of 12 minutes before the Royal car drew up at the Town Hall, shown above.

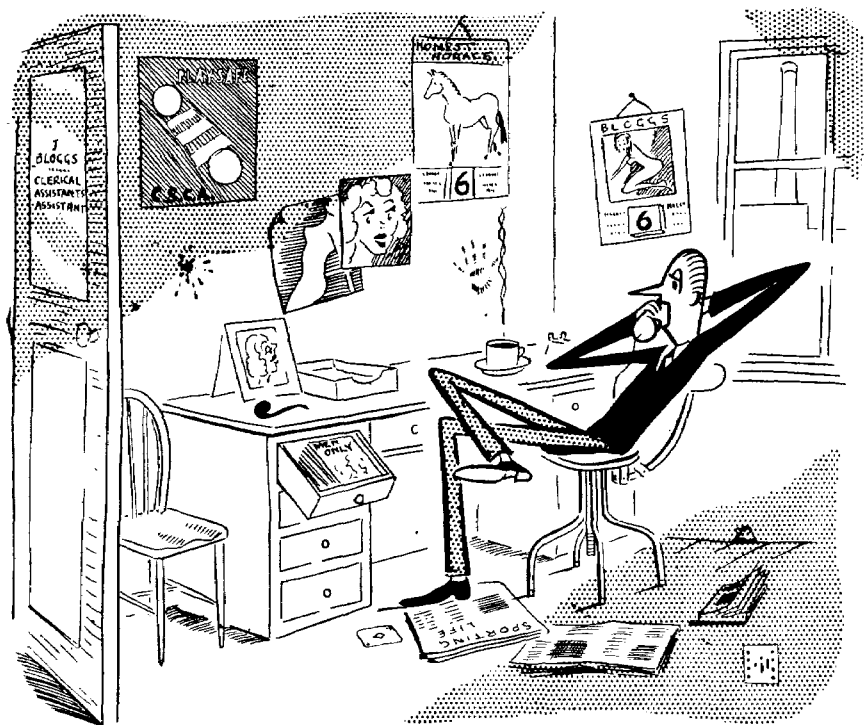
After presentations and the loyal address by the Mayor, came the Queen's reply in which she congratulated them on their splendid past and wished for them an even better future. A plaque commemorating the 800th anniversary of the town's first charter was unveiled and the Queen then accepted the original of the above etching by G. C. Ashworth, A.E.R.E. Establishments, reproduced here by courtesy of "The Daily Telegraph".

The 17th Century Town Hall that is illustrated stands in the Market Place and formerly included the borough prison with stocks and whipping post at the west wall. The market used to be held between the pillars supporting the main room, which is now used as a court and town assembly hall with Council Chamber adjoining. The oak panels of the walls reveal the names of Mayors from 1231 to the present day.

For 200 years, from 1150, Wallingford was a town of great importance to England. Here King Henry II held his Court in 1155 and in that year presented to the town its first Charter, by which it can claim to be one of the oldest English Boroughs.

The return of Royalty in the person of H.M. The Queen made this year also a memorable one for Wallingford.

D.A.T.



Illustrated by Reg Heath
who also designed the cover.

"Stage
Two
Reactor

Stage
Three
Potentialities . . .

Hullo!

This
Is
Bloggs
Here!"

SCIENCE

DURING the seven years (1) in which the author has enjoyed the seclusion of the Harwell perimeter, the seeds first sown by Potter and his school of Lifemanship at Yeovil have borne fruit; this may be observed in the growth of Sciencemanship—now a flourishing art with its attendant Harwellian gambit and promotion ploys. The rigid class structure pertaining to the Authority has led to desires of attaining a state of one-upness over those known to be of equal, or preferably, higher, rank. It is the purpose of this little note (2) to record some of the classic methods which have been observed. It is hoped that in this way even the humblest of us may experience the satisfaction of a successful *coup*, and avoid the ultimate fate of

those who are forced to the depths of ignominy—ploughed by their own gambit.

1. THE TELEPHONE GAMBIT

The simple act of answering the telephone offers immediately to the skilled scienceman a telling method of establishing his one-upness. How often does one hear the phrase "Hullo", "Yes" or "4444?" used! Yet by the use of simple phrases uttered as the telephone is lifted from its cradle to one's ear, one can create immediately an atmosphere of bustling urgency or deep wisdom.

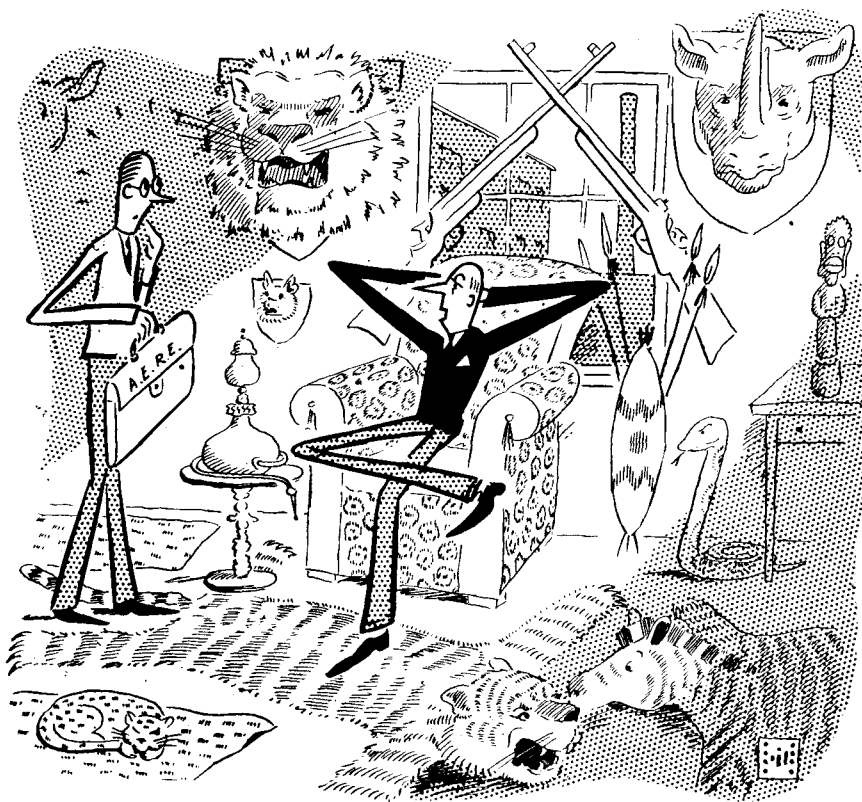
We strongly recommend the following for general use:

"... A stage II reactor of course, but with stage III potentialities . . . Hullo! Bloggs here!
"... difficult to get high grade staff . . .

(1) Implying a profound air of authority—"since the Gleep era" is a good one, too.

(2) There have been other, and bigger, notes, one thinks.

Equally
neat
is the
suggestion
that
one is
fully
occupied
elsewhere
by
non-scientific
pursuits.



ANSHIP

Clangstrap!

'... meeting in five minutes, tied up on Thursday, but I'll fit you in ... Finkleberry here!

The caller, of course, has a range of counter-gambits at his disposal; probably the most effective is *"I'll ring back at 6 o'clock tonight"*.

2. THE "I-HAVE-INTERESTS-OTHER-THAN-MY-WORK" PLOY.

There are those of us who endeavour to impress by sheer weight of learning. Their desks are piled high with opened (but unread) books, offices filled with filing cabinets (containing sugar and tea) and telephones answered by a female assistant in a secretary-like voice. How much neater is the suggestion that one is fully occupied elsewhere by non-scientific pursuit! There is the *"getting elected to the*

local council" gambit, or one can bribe one's way to be Akela to a Cub pack—to mention only two well-tried approaches. But one can do no better than emulate that well known figure T. Cost. Him I consider to be the outstanding scienceman among us. The casual visitor finds his desk a welter of correspondence from his publishers (3) speared to the surface of his desk with an Indian knife, abstruse reports are propped open with a well-thumbed score of the *"Messiah"*, whilst an invitation to lunch at the Foreign Office lies casually in his IN-tray. Need I go on?—the impact on the tyro is enormous, and when backed up by a judiciously timed telephone call from T's architect, even the most hardened scienceman is at a loss for a counterploy.

(3) Publishers, an absolutely O.K. connection. Bankers are O.K. too.

3. MEETINGMANSHIP

Much of the work of a large establishment is conducted at meetings, and here the skilled scienceman finds ample outlet for his powers. Simplicity is the keynote; no-one at a meeting is impressed by verbose "how-clever-am-I-manship". Consider for example the 'sums' gambit so well employed by A Pile. Whereas the beginner would offer an opening remark such as "*A solution of the Boltzmann integro-differential equation can be obtained by triangular integration over the region by the saddle-point method of Umbilicus et al*", Pile would quietly remark "*When you've done the sum you get . . .*" and thus convince the meeting of his own powers whilst concealing the fact that his assistant had done the work. This field is still developing and we watch with interest the flowering of T. Cost's "coming in late from another meeting" ploy.

4. PROMOTION PLOYS

Promotion! The very word strikes hope and terror into the layman, and even the most brilliant of us have been known to feel a momentary quiver on entering the boardroom. Not that we can all follow the daring gambit of T. Cost, who arranged for external telephone calls to be transferred to him whilst appearing before a board, and had to be ex-

cused after twenty minutes as he had to catch a train to "*the North*". (4) But much can be done by deft and unobtrusive thrusts at the psychological moment. We proffer a set of "*board phrases*"; inserted into the conversation at appropriate moments they are guaranteed to produce a profound effect:

"... *an extensive search of the more recent literature . . .*"

"... *an interesting, but superficial, demonstration of Filthsky's effect . . .*"

"... *long-term effects of fission product build-up on reactivity for Stage I reactors . . .*"

The scienceman must recall that the seeds of promotion must be sown early to produce a healthy flower. A complete description of the necessary ploys is beyond the scope of this paper, but we may note *en passant* the following:

(a) Violent courtship of the Division Heads' secretary.

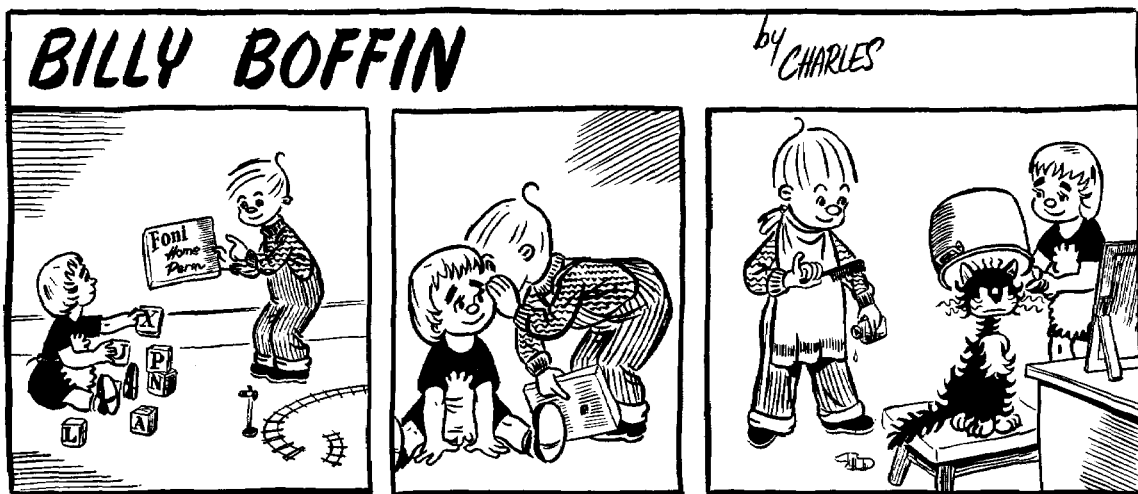
(b) Covering one's blackboard with suitable esoteric formulae (obtainable with sticky backs in Greek letters post-free from this office), and

(c) The art of continuous outside duties.

But enough—let us hope these few words will set the laymans' feet firmly on the ladder, and refresh the memories of those long skilled in these arts.

KLEEF.

(4) "The North", i.e. Windscale. People are always left with the uneasy feeling that something is going on "in the North" which they don't know about.



DOWN SOUTH

... TO BE READ BY THE WARMTH
OF THE WINTER FIRESIDE ...

K. C. HINES
(REACTOR DIVISION)

In 1948 the Australian Government sent two expeditions to the Sub-Antarctic with the object of obtaining extensive scientific data on Heard and Macquarie Islands. The party consisted of thirteen men: three meteorologists, three radio operators, two physicists, biologist, engineer, photographer, doctor and cook. This article gives an account of some of the first impressions of Macquarie Island as seen by one of the expedition members.

THE first glimpses of what was to be our home for the next twelve months were obtained under ideal conditions and tended to give us too promising a picture of the surroundings. Anyone used to living in regions where fog, mist and sleet are the rule will know how dreary and depressing the monotony of indistinct outlines and dull grey colour becomes after a time and what magical transformation a burst of sunshine can make in such conditions. The temperature rose to 50 degrees fahrenheit, and it is interesting to note that the highest temperature recorded during the whole of our stay on the island, apart from the first day, was 47 degrees. It seemed that the island was determined to present itself to us in an attractive light and so to avoid the strong reaction of distaste which its normal appearance would produce.

The penguins disporting themselves close to the ship were a source of great interest. These birds travel with amazing speed in water, and the rapidity with which they can turn and twist is surprising in view of their apparent lack of an effective steering apparatus. They swim for the most part a foot or so beneath the surface of the water and it is possible to make out the blurred white tracks from a considerable distance. At intervals of about fifty feet the penguins leap dolphin-fashion right out of the water and present an appearance of boundless *joie de vivre* as they dive back

into the water with a resounding splash, the bright colours of the head scintillating in the sunlight and the jet black of the wet back feathers glistening in contrast with the snow-white breasts.

At 10 a.m. a landing craft left the ship carrying a party entrusted with the task of examining the possibilities of setting up a camp on the isthmus connecting Wireless Hill, at the northern tip of the island, with the main plateau. This spot had been chosen by the members of Mawson's 1911 expedition and it was discovered that their hut was still standing, although in a state of extreme disrepair. With regard to the camp site, it was found that the north end of the isthmus, suitable in many ways, was already in the possession of a large group of sea elephants making their presence painfully apparent by the abominable stench emitted from the bogs in which they were lying. When this site was eventually chosen it became our task to assert the claims of civilisation against the existing occupants, although the prevailing south-west wind rendered us greatly susceptible to the sea elephant's most potent weapon.

Most of the scientific party were able to get ashore late in the afternoon and examine the details of the isthmus more closely. The beach was found to consist mainly of stones worn quite smooth by the pounding surf, and at many places large piles of kelp had been tossed

on to the beach, where much of it was already in an advanced state of decay. The kelp is dark brown in colour when freshly washed up, but as it rots becomes a bright orange and gives off an aroma which commanded as much respect as that of the sea elephants.

A closer examination of Mawson's old hut showed that the walls were still in fairly good condition, although both the roof and floor had partly collapsed. Fossicking about, we were able to find many relics of the previous expedition, notable among which was a variety of foodstuffs ranging from sago and tea, which appeared to be still usable, to a lump of cheese. This latter was well decomposed, being by this time 37 years old, and served to complete the trio of unaccustomed odours of the day.

Landing operations were not completely straightforward. The beachhead itself was far from ideal, the usable part being little more than twenty yards wide. To the north a formidable barrier of rock extended roughly a hundred yards out to sea, while a solitary rock stood about fifty yards from the shore on the other side, effectively limiting the navigable region to a narrow channel extending about

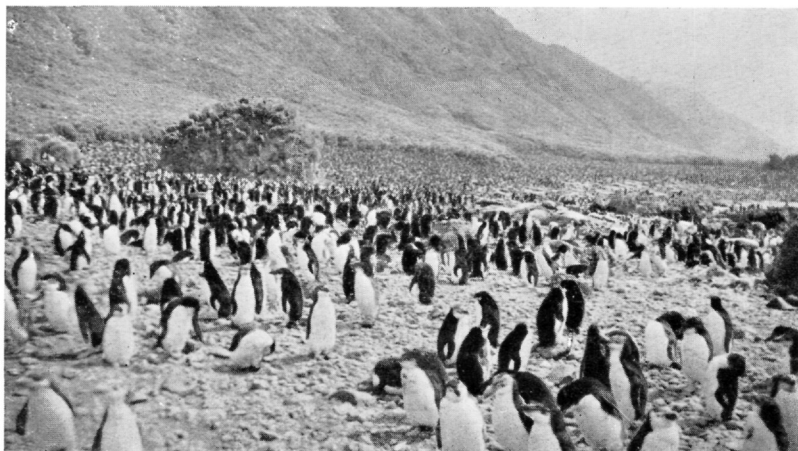
fifty yards from the beach. Deviations to either side of this channel would mean striking rocks, and the channel itself was covered with kelp and contained many smaller rocks which constituted a particular menace at low tide.

Those spending the night ashore during the first couple of weeks of the landing used the tents as living quarters, a habit which took some getting used to in view of the fact that the wind was always strong and resulted in the tent-fly flapping violently against the tent itself. We were fortunate at this stage in discovering a crate of stretcher beds, so that it was possible to recline a couple of feet above the mud and pools of water forming the floor of the tents. This fact, while of undisputed advantage to those individuals fortunate enough to be of average height, had drawbacks for those, like myself, exceeding the six-foot limit, as we were obliged to sleep with either feet or head against the tent and one or other extremity was subjected to a continual pummelling from the madly flapping canvas. It is an evidence of human adaptability that the giants of the party benefited almost as much from the night's rest as the more favoured members.



PEACE
AND
QUIET . . .

... AWAY
FROM
THE
CROWDS



It was generally agreed that the worst feature of these nights ashore was getting dressed the following morning. On removing one's socks before going to bed it was necessary to wring the sea water out of them, and by morning they were no drier, but considerably colder, and it was some time before the body would adapt itself to contact with damp and clammy clothes after the comparative comfort of a reasonably dry sleeping bag.

By the end of the first week considerable progress had been made with the unloading, but bad weather continued to waste valuable time and the operations were further hampered by the degeneration of the path from beach-head to camp into a sea of mud. The stage was soon reached when the army dukws became bogged along the path at almost every trip and a good deal of delay was caused in this way. It was quite common to see someone with feet so firmly embedded in the mud that assistance was required to extricate him.

A source of amusement was the difficulty of handling small boats with oars in the normal conditions of wind and sea. On one occasion a pontoon, in process of being dragged ashore from a bouy anchored at the head of the channel, became stuck on a submerged rock and in order to float it off it was necessary to

push its load of oil drums into the water one at a time, after tying a rope to them, and to haul the drums ashore. Inevitably some of them broke loose and began drifting out to sea and this resulted in a dinghy pushing off from shore in an attempt to round up the offenders. So strongly was it necessary to row in order to make headway against the wind that one of the oars was broken almost at once and the boat drifted helplessly among the drums it was intended to salvage. The southerly wind eventually carried it towards the rocks bordering the channel and the would-be sailors were able to grasp some strands of kelp and drag the boat to a safe position, one of the occupants leaping in spectacular fashion on to the rocks, to return shortly afterwards with two more oars which he threw to the three remaining occupants of the dinghy enabling them to push off in a second attempt to carry out their original design. Row as they would, however, the best they could do was to maintain their position against the wind while continually drifting out to sea, and from the shore the sight of the men rowing frantically and making absolutely no progress caused some amusement. It soon became obvious that, not only were the intrepid seamen incapable of recovering the errant drums, but also were quite unable to get themselves and their boat back to shore; they were finally taken in tow by a

A.E.R.E.

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motor launch. The unloading of stores and equipment had been almost completed two weeks after our arrival, and everyone was engaged on shore either building huts or trying to arrange the stuff in some sort of order. The crates had been arranged systematically in the ship's hold but unfortunately it was necessary to work so rapidly during spells of good weather that all the groups were completely mixed up in the dumping ground to the west of the camp. It took some days to sort the boxes into their correct groups and cover everything with tarpaulins, but we found it necessary to do this as it was quite a hopeless task looking for, say, a box of nuts and bolts when the whole dump had to be examined.

After about three weeks had elapsed the camp was sufficiently well established to enable the ship to leave for Australia.

On the night before this important event, it was decided to hold a farewell party on board the L.S.T. To enable everyone to be present we stopped work a little earlier than usual, and it was not yet 5 o'clock when the first boatload of men rowed out from the landing beach to the waiting launch cruising slowly near the buoy. Trouble started when a line from the dinghy became caught in the propeller of the L.C.V.P., rendering it quite uncontrollable. The dinghy was immediately rowed back to shore and someone sent in search of a dukw driver. In the meantime, however, the stricken craft was beginning to drift rapidly towards the rocks under the influence of a steady south-westerly, and it was decided by Mr. Hayter (Second Officer of the L.S.T.) to make an immediate attempt to save the boat. He and several sailors climbed in to the dinghy and, rowing towards the L.C.V.P. were soon close enough to heave a line which was made fast to a cleat aboard the drifting boat, while the oarsmen aboard the dinghy rowed furiously against the wind in an effort to reach the large rock which has been mentioned as guarding the southern approach to the channel. In spite of their exertion progress was slow but eventually they drew

near enough to the rock for Mr. Hayter to leap on to it brandishing the loose end of the tow rope which he then contrived to wrap round a jagged piece of rock, so bringing the situation under control. This state of affairs was not to last, however, as the rope was not sufficiently strong to restrain the onward sweep of the L.C.V.P., and snapped soon after becoming taut. The dinghy, in attempting to return in the direction of the drifting boat, was blown out to sea and disappeared from the view of those on shore round the point of the rock. The L.C.V.P. was very soon piled up on the rocks, but fortunately all on board managed to scramble ashore unharmed, and although the boat itself was a total loss it was possible some days later to salvage the valuable engine. The men in the dinghy had their work cut out to keep the tiny craft headed towards the L.S.T., but were persistent enough in their efforts to strike the ship roughly amidships and were quickly hauled on board.

Everyone involved in the debacle had now been snatched back from the clutches of the ocean except Mr. Hayter, whose solitary figure silhouetted against the leaden sky made a pathetic spectacle in the rapidly deepening twilight. The beachhead now became a scene of great activity as people came down from the camp site with lanterns and Very lamps. Finally a radio operator arrived on the scene with a walkie-talkie communications set, enabling radio contact from ship to shore to be maintained and a long series of deliberations was initiated as to the quickest way of rescuing Mr. Hayter from his unenviable perch. It was finally decided to attempt the rescue with a dukw. One was soon dispatched from the ship and we were able to follow its progress by watching the headlights. When the dukw had reached the region of the channel it was already too dark to make out the dangerous smaller rocks, but the risk had to be taken. The driver took the craft as close as possible to the marooned man, who was thrown a rope and, after jumping into the water, was dragged aboard. Mr. Hayter's only reaction was one of indignation that a dukw



A BULL ELEPHANT (*right*)
ENCOUNTERS THE AUTHOR!

had been risked in his rescue and he asserted that he had been prepared to spend the night on his windswept rock, a procedure which, apart from its obvious discomforts, would have entailed considerable danger since a heavy sea developing in the course of the night would have swept a man from so precarious a position into the seething water below. The rock was subsequently known to us as "Hayter's Rock".

The following day we must have presented a forlorn sight from the ship, as we gathered on the landing beach to watch the departure. As the ship raised anchor and moved slowly off, shooting coloured rockets into the air and blowing the siren madly, everyone waved frantically at the still distinguishable figures on board. As the vessel rounded the point, people dashed along the beach under Wireless Hill as far as possible to catch a last glimpse, but the ship was soon swallowed up by the rapidly descending mist. Our last link with civilisation was gone.

Twelve months were to elapse before the return of the ship to collect us and the information we were here to compile.

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CONTINUING
THE HOMOLKA GUIDE TO

HARWELL TYPES

PART III

IN the last issue we touched upon the general types and broached the subject of dress and habit as a guide to identification. Sub-divisions (a) Pseudo and (b) Normal were left over for this edition.

At the onset we must warn our readers that the habit study of the Pseudo Type is not an easy matter. They exude a sort of poised uneasiness, but this might be a bit misleading, as the same condition is seen in Administration Types with holes in their socks. One well-defined characteristic, however, is the air of social adaptability. For example, their method of addressing others consists of five standard phrases: (1) "Sir", for all grades above P.S.O., (2) "Old Chap", for all grades immediately below P.S.O., (3) "Cock", for all immediate superiors, (4) "Bog-eye" or "Stinker" for all equals and (5) "My good man", reserved for inferiors.

Pseudo Types are always just about to do something, such as organising a dance, making up a standard solution or paying their tea-money. They never actually get around to doing it, as they are too busy being just about to do something else. This delightful air of great expectation is decidedly one of the hall-marks of the Type.



"... AN AIR OF PATIENT FRUSTRATION"

The Pseudo class is often mistaken for Types (2), (3) or (5), i.e. Chemists, Physicists or Very Rare, as they give the impression of knowing much more about chemistry, physics enough, they are never mistaken for the Engineer or Administration classes. This may be on account of the rather exotic outside dress, or, more likely because of the spotless laboratory coat, usually with turned up collar and top pocket crammed with pens and seven figure logarithms. Lastly, Pseudo Types are generally unmarried. Getting married is presumably another thing they are always just about to do. On the whole, this Type is rather likeable, although unpredictable. Summing up, we should describe the general characteristic as one of pregnant aimlessness.

Normal Types are perhaps the most uninteresting psychologically, although some odd habits might be detected. Unlike other Types, their habits have an essentially practical purpose. In this category we might place the people who keep the Establishment ticking over, e.g. Plumbers, Electricians, Joiners, etc.

Identification by dress is rather inconclusive as they may well be mistaken for Experimental Officers with car trouble. Short, white duffel coats might be a pointer, but here care should be taken not to confuse them with female Geneticists going for lunch.

It is not widely appreciated that Plumbers, Joiners, Electricians, etc. are rather timid people outside their environment and are afraid of venturing out alone. This should explain to the visitor why the type who comes to fix the fuse is always accompanied by a friend carrying the fuse wire. As they dislike being cut off from their associates for very long, they are invariably joined before long by two more.

The timidity of the Normal Type, however, is restricted entirely to travelling. At work, their habits are unmistakable. They, of all types, know exactly what they are doing and this sort of fruitless, unswerving dedication to the business on hand is definitely the thing to look for. They will cut down pipes, rip up floor boards, knock holes in the wall and cut off the water supply without batting an eyelid. The awe-inspiring and intimidating effect that this has on all other Types is well worth observing.

Before examining in more detail the idiosyncrasies of the various classes we might briefly draw attention to some smaller sub-groups not, strictly speaking, coming under the Types mentioned.

Medical Types, for examples, are a small, but well-defined, lot embodying many of the worse aspects of the main Types. Their dress, as a rule, is unspectacular. The only characteristic feature in this respect is the laboratory coat. This is always snow-white—even whiter than that of the Pseudo class—and gives a rather disturbing impression of purity and extreme hygiene. The more experienced members have carefully placed spots of blood or disinfectant on the coat to enhance the whiteness.

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BEST BEERS ON DRAUGHT AND IN BOTTLE

Medical Types have invariably a rather cynical and detached outlook. This is reflected in their habits which should be watched for carefully. They can be seen wiping scalpels or sticking hypodermic needles into various things, discussing at the same time the latest Test score. They also have the rather clever knack of being able to sleep with their noses resting on microscopes. A great deal of their time is spent on an occupation called "getting-things-ready". There is some slight analogy between this and the chief occupation of Pseudo Types, only it is all done with terrifying efficiency. Broadly, we should say the main characteristic is a sort of refined coarseness. It is worth noticing that the less human of the Medical Types are kept in a special enclosure, outside the Establishment altogether, along with monkeys and rats. As yet, nothing much is known about this group and visitors are advised to avoid any attempts at close study until a proper survey has been carried out.



"... AN AIR OF GREAT EXPECTATION"

Under the smaller sub-sections we might also place the Protective Types, embodying Police, Firemen and Safety Personnel.

The dress of Policemen and Firemen is self-evident, but a word on habits might be of interest. Even out of uniform, Firemen can usually be identified by their air of patient frustration. Due to a clause in the Official Secrets Act, large fires are forbidden in the Establishment. The permissible small ones are invariably put out by the types who started them and, accordingly, Firemen spend much of their time filling up empty fire extinguishers which they did not even have the satisfaction of using. This engenders the characteristic look of wistful longing and also may be the reason why they often smoke heavily.

Policemen might possibly be placed in the Normal Type group, but we prefer to list them in the sub-groups. They resemble Medical Types in having a rather cynical, analytical outlook. This is understandable when we consider the large quantities of Harwell faces which pass in untidy profusion past them each

day. One possible unique characteristic worth looking for in Policemen is the extraordinary chameleon quality they nearly all possess. The visitor, no doubt, has been surprised to find each time he passes through a gate that there is apparently a different policeman there. This lightning change gives wrong-doers a false sense of security. In effect, it is the same constable each time, who remembers in minute detail how many A.E.R.E. bicycles you were riding when you went out. This versatility in appearance is certainly well worth observing. Actually, rumour has it that there are really only six policemen in the whole Establishment—each capable of many transformations.

Lack of space prevents us giving the promised detailed habits of each Type. The detection of unmarried Divisional Administrative Officers has been withdrawn as too difficult for the novice because there are too few characteristics to differentiate them from married ones. In a future issue we hope to discuss their eating and digestive foibles and also speaking mannerisms.

★ ★ ★

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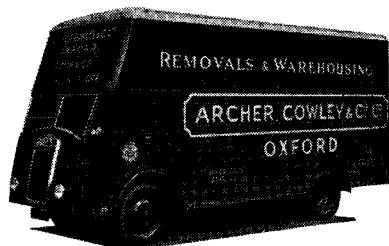
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SPOTLIGHT ON . . .

The Wantage Revellers



A visit to Wantage at pantomime time will reveal how Harwellians, often new to the area, have become submerged in local activities — other than politics. Here Harwell Staff may show you to your seat, while other colleagues play from the orchestra; then as the curtain rises Harwell staff may be seen against scenery painted by other Harwellians. The productions are combined operations with others who regard Wantage as their home.

IT was a modest little notice in the 'small ads' column of the local press in 1948 that started it all. It read, "Will anyone interested in forming a concert party please attend a meeting at the X—— Hall on Monday." From that small beginning sprang the Wantage Revellers, a concert party capable of producing an annual pantomime, summer show and odds and ends of similar entertainment.

The story of their progress is a full one, not without its moments of anxiety but with an overall pattern of light-hearted fun in the best tradition of the stage world. The enthusiasm of the amateur is a very powerful force, and it seems to be this intense enthusiasm which has carried the Revellers over their obstacles, and sustained them when less bold spirits would have faltered and fallen.

But to start at the beginning. The small crowd who answered the advertisement became the first members of the Revellers. A constitution was formed, a few rules drawn up and members chosen to write and produce the first show. At the same time the ladies busied themselves organizing a jumble sale to provide the funds necessary for the expenses that would be incurred. Then followed a few hectic weeks. The scriptwriters, chewing their pencils for inspiration, worked hard with whole scenes being written up only to be scrapped when technical difficulties proved insuperable.

At last the script was ready and the producer, having selected his cast, commenced rehearsals. These have always been something in the nature of a light-hearted frolic. The producer must never expect the respect and attention usually paid to such august

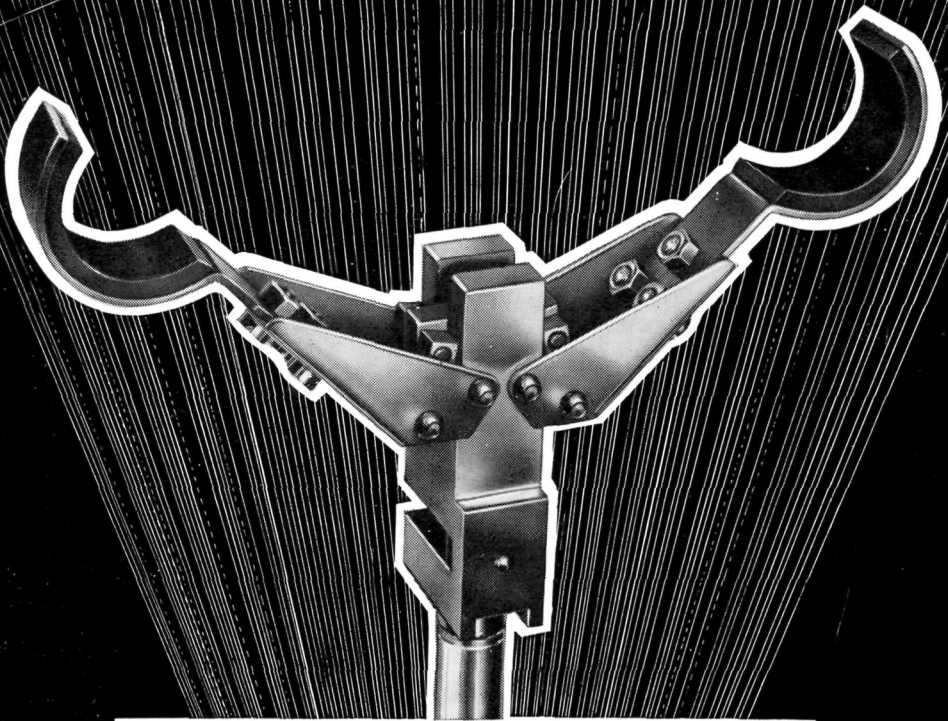
persons. And he must not expect to rule his cast with normal discipline. All of which must sound most unpromising to the uninitiated and completely chaotic to those familiar with stage routine. Results, however, speak for themselves and, despite topsyturvy rehearsals, shows have always been well received. Perhaps it is the pervading air of drollery and whole-hearted fun engendered at those rehearsals which penetrates into the show itself and reaches out across the footlights to the audience.

But I digress. They succeeded in knocking the show into some sort of shape only to discover more troubles: no scenery, no costumes and no lighting equipment. Although a long list of "props" had to be begged, borrowed or stolen, the curtain went up on a chorus of immaculately dressed boys and girls when the first show "Off the Ration", was presented to the Public.

The Revellers have come a long way since 1948, and, besides a very comprehensive lighting set, wardrobe, make-up department and scenery, have collected a number of props and effects. The crazy humour created by the slapstick and trick effects in the first show appealed to the local public and encouraged them to go ahead with a second attempt. This took the form of a number of gags, sketches and songs linked together, as in the first show, by three characters who wandered through the show, their adventures providing the main theme. In this way they rather broke away from the traditional compère type of concert party show with introductory speeches, etc., but as this technique of presentation was developed the experience gained by all concerned

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started a trend of thought towards putting on a pantomime. The enthusiasts were not to be deterred, and in due course "Cinderella" justified their optimism and became the fore-runner of what was destined to be a yearly event.

By this time some sort of lighting arrangement and a Heath Robinson contraption were available on which were clipped sheets of Essex board for the scenery to be painted. In view of the fact that shows were given in a hired hall this ingenious framework had to be portable, and so was held together with a miscellaneous collection of nuts and bolts. After the show it was dismantled and stowed away. At the next erection, it was discovered that not only were some of the very necessary nuts and bolts missing, but that all the parts were not interchangeable and had not been marked to indicate their position. This caused the stage manager more than one headache, even if it gave him an opportunity to exercise his vocabulary especially when it was discovered that half the framework had been erected **upside down**. Moreover, the various pieces of scenery had to be changed independently, and one miscreant is still trying to live down the episode when during the pantomime "Babes in the Wood" he changed nearly all that scenery except one side flat—the result being that the Baron's study scene appeared quite normal except for a large tree which formed one wall!

Every show has had its own humorous situations. Strangely enough some of the funnier situations have been entirely missed by the audience, whilst backstage and offstage cast have been convulsed with laughter. Not all the trials and troubles have developed on the set however, sometimes a technical fault has been responsible. The local electricity supply once failed and even the most expert lighting technician couldn't rectify that. The show carried on for about twenty minutes by the light of several torches held by stage assistants from various points behind the proscenium. Naturally the normal show was discontinued and an improvised performance by two of the cast kept the audience's attention until, to the accompaniment of a combined cheer from entertainers and entertained, the lights suddenly came to life again.

One incident, but for the quick wit of those concerned, nearly spelt disaster to a particular show. On this occasion one of the characters lost his voice. The problem was solved by getting the actor to mime his part whilst his supporting characters apparently repeated his speeches. The artist concerned visited the doctor to see if a remedy could be found. He expected a gargle of some sort and was consequently



AN UNEXPECTED SOLUTION FOR A PROBLEM
THAT NEARLY SPELT DISASTER.

very surprised when the doctor gave him an injection of penicillin in the opposite end of his anatomy! The happy ending was that he regained his voice before the final night of the show.

The active life of the Revellers has become an integral part of the life of Wantage, and the shows are anticipated as events of the year. Needless to say, with several years experience stage technique and presentation have improved tremendously. They have been lucky in securing the services of scenic artists, musicians and lighting experts, people who make the show just as much as the cast, and the usual stout-hearted crowd who ensure that the wardrobe is ready, that the stage and its fittings are prepared, and that the programmes, publicity and admission tickets are cared for.

So much for the production of shows by the Revellers. But the good work does not stop there. During the years it has existed, well over £300 have been sent to various charitable organizations and, possibly as important, it has given interesting and instructive occupation to its young members and formed many friendships through its activities both on and off the amateur stage.

Proof Readers Competition

Once again this attracted a great number of entries.

No all-correct entry being received, the first prize of one guinea goes to Mrs. S. M. Mullins of Naval Section, Bld 60T, who submitted the nearest correst entry. One mark behind in second place, was Dr. J. B. Sykes, Bld. 8.9, who receives 10/6. He is now away on "outside duties" in the U.S.A. and we are forwarding a copy of this issue to him with wishes of greater success.

Although many original errors were concocted by competitors none succeeded in discovering a unique *and* correct entry, and so this prize has been carried forward to the next number.

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Red herrings were again prominent. It would be tactful not to mention who submitted that 'billets' should be 'bullets' in the Johnson, Matthey announcement. Presumably, not an engineering type? 'Molekulargewichtsbestimmungsmethode' (Blackwell's), contrary to several suppositions, *was* correctly spelt and John Parker, our aboriginal newsagent, *was* here in 1931.

The ten more widely spotted errors were as follows:

Cover Bailey's—*Startright* for *Startrite*.

Cover Beesley's—*Fabricks* for *Fabrics*.

p. 3 Brett's—*Practise* for *Practice*.

p. 3 Faulkner & Son—Varying founts for '1' in 1910.

p. 4 Chatwood Milner—United Kingdom Atomic Energy *Establishment* for Authority.

p. 8 Blackwell's—Apostrophe omitted from first '*Blackwell's*'.

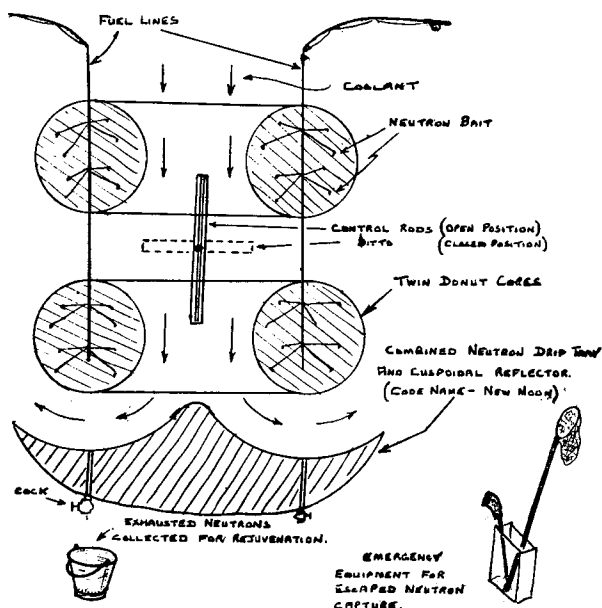
p. 10 Trustee Savings Bank—*Througthut* for *Throughout*.

p. 33 West Anglia—*Miminum* for *Minimum*.

p. 37 Adkin, Belcher & Bowen—Inconsistency in punctuation in addresses.

p. 38 Grays Inn Tent Shop—*Sprung* for *Spring*.

For the competition in this issue the number of errors that have been inserted, with the co-operation of the business houses concerned, will not be specified. A prize of 21/- will be awarded to the reader submitting the most comprehensive list, with second prize of 10/6 for the runner-up and book tokens for any unique finds. We would stress that the competition is confined to errors in the advertisements and that the closing date for entries is January 31st. They should be addressed to 'Harlequin Proof Readers' Competition, c/o Central Registry, A.E.R.E., Harwell'.



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OPTWAOEW—One Pound to Win and One each Way (U.K.)

DORS—Deuterium Oscillating Research Syclon (U.K. on loan to U.S.)

MONROE—(Needs no description) (U.S. on loan to U.K.)

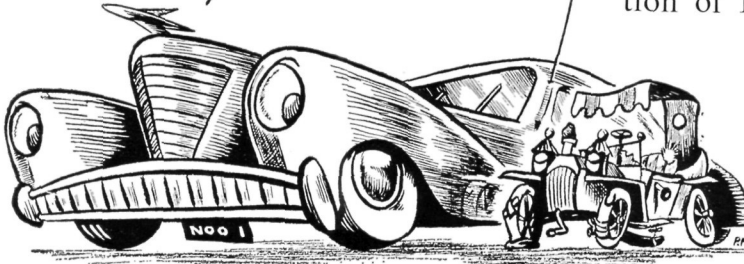
HIPP—High Intensity Plutonium Producer (U.N.)

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HURRA—(at the point the designer discovered DORS (U.N.)

HELP—Not required with DORS or MONROE (U/S)

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When the old brain tries to capture
Youthful nucleonic rapture
It gets a fearful battering
From inelastic scattering.

Its cross section of absorption
Deflects the passing neutron
And so we have to moderate
Until we reach the thermal state.

Then sit at school the livelong day
Fertile to all they draw and say
Ejecting only gamma rays
To try and clear the physics haze.

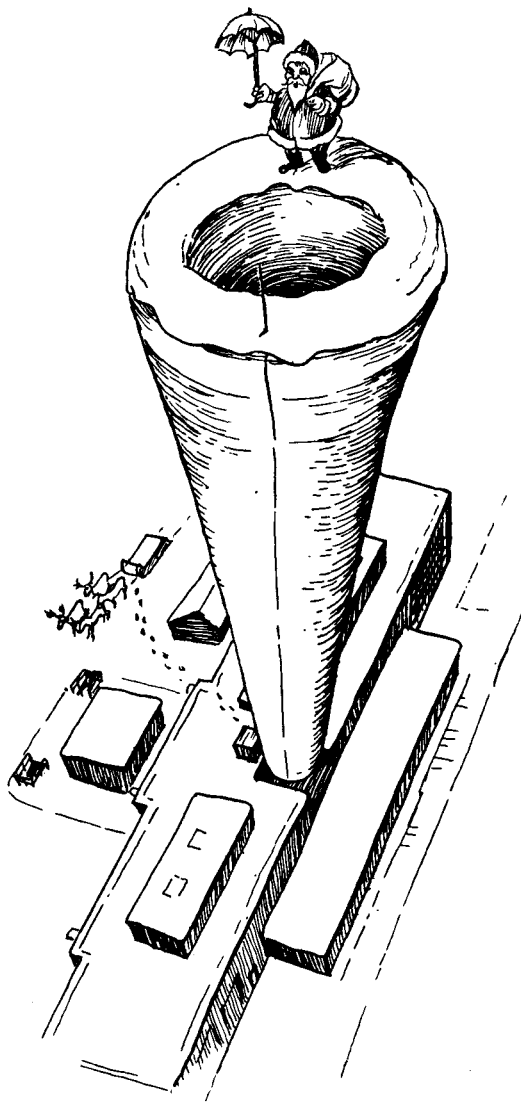
But soon the brain begins to tire
For nuclear poison dims the fire
So to the process plant we go
To purify our 240.

With Bepo, Lido, Gleep and all
We once more are critical
From two short weeks at Lincoln College.
And soon return enriched with knowledge

Sir Ralph Cochrane.

★

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OF BEPO CHIMNEY by A. H. Humphreys
who also did the drawings for pages 9, 37 & 43.



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Competition Entries must also be off by JANUARY 31st.

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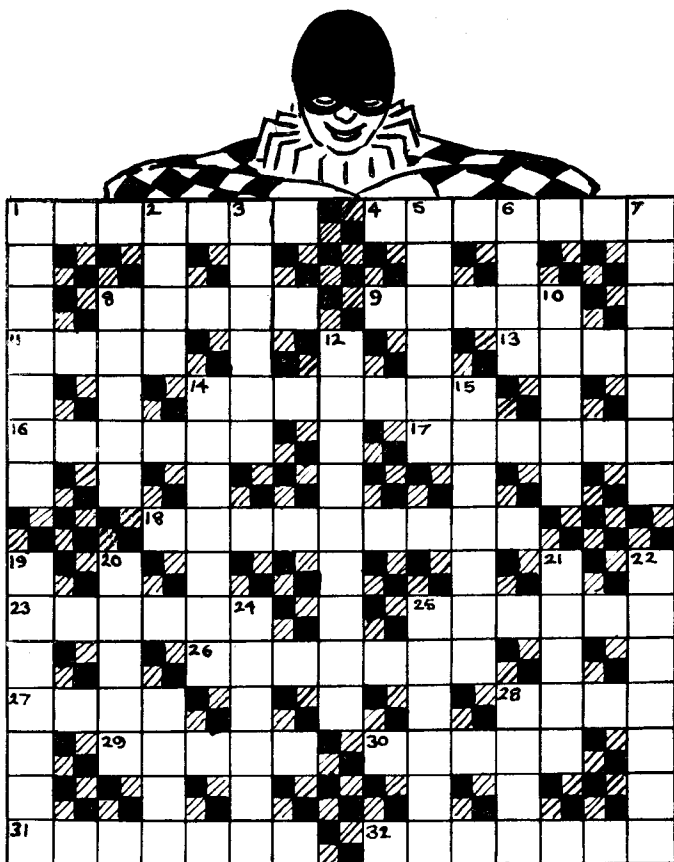
One guinea will be awarded the sender of the first correct entry opened. Closing date, 31 Jan.

ACROSS

1. T should be enough (7).
4. Eee 8 (2, 5).
8. 4. It's no go the (Macneice) (5).
9. A scourge (5).
11. Where Wallace (4).
13. Jones or Crocket (4).
14. Concentrated artillery fire (7).
16. Sounds as if it should be eaten before Easter (6).
17. Worn out (6).
18. Study the offer (9).
23. Native Seaman (6).
25. To accomplish (6).
26. Feet (3, 4).
27. De Camp (4).
28. Née (4).
29. Heart (Anagram) (5).
30. The town was dull because he wasn't there (5).
31. He is slow (7).
32. American Depot (7).

DOWN

1. Unshaven evidence (7).
2. Departed (4).
3. Pen (6).
5. Constrain (6).
6. Roman poet (4).
7. Brewer's men (7).
8. Intended (5).
10. Shoot hen or stratum (5).
12. Better than cured (9).
14. Fuel upset at the B.I.F. (7).
15. Personal estate (7).
19. Socialist's description of a Capitalist (7).
20. Ideas in another way (5).
21. Noble Joint (5).
22. Anonymous (7).
24. Jimmy Edwards was once one (6).
25. To the right (6).
28. Peer from Shakespeare's King (4).
29. Egyptian girl.





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 And when inventions multiply,
 And science does so much,
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 Do the work of man and horse.
 We've found the means of harnessing
 Th'ingredients of our sphere,
 And made them do the jobs *men* did
 Before machines were here—
 For in our workmanship today,
 In music, art and such,
 The medium of a soul-less tool
 Oft kills the *Human Touch*.

So in this age of progress
 In which we have our place,
 If we could seek the main-spring
 Of the glory of our Race.
 Then its' deeper than the working
 And the probing of the mind,
 And its' loftier than the products
 Of the genius of our Kind !
 The *Human Touch* the touch Divine
 Upon the earthly clod
 That takes the vileness of our man
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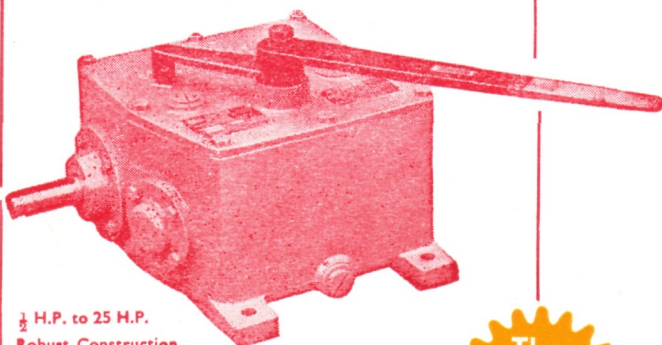
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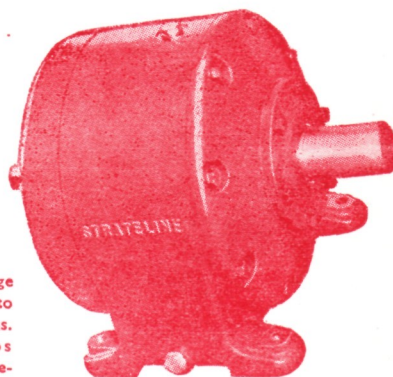
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