

BULLETIN
of the
BRITISH INTERPLANETARY SOCIETY.

Vol. 2.
No. 8.

September
1938.

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Editorial.

With this issue we are extending the "Bulletin" to twelve pages, making a total of over 3,000 words. We hope to maintain it at this size and if possible to add another four pages as funds permit. But even with this size we shall need a good deal of material in the form of articles, etc., which we are relying on members to supply. If you have anything which you may think suitable, please send it along and it will be thankfully received. Articles, reports of experiments, news items—everything will be welcome. In particular, we should like letters which, if suitable, will be reproduced in a special section of the "Bulletin". Please send us your suggestions, criticisms and ideas, but remember that our space is not unlimited!

We are very glad to announce that the E.I.S. is now in a position to produce a new "Journal", and work has already been started on it. Although we cannot guarantee any particular publication date, it will be out at the earliest possible moment. It will contain among other matters, a full account of the Experimental Committee's work up to the present date.

We are making a little experiment in this issue which we hope will meet with approval. One of the non-technical members has written a report of an experimental committee meeting he attended, and we are reproducing it in this "Bulletin" as part of our policy of getting more "human interest" into the Society. There is no one who cannot afford to laugh at himself, and a sense of humour distinguishes the enthusiast from the crank. All the same, we might warn members not to take all of Mr Temple's remarks too seriously! If you want to know what really happens at these meetings, remember that your presence will always be welcomed.

As no issue of the "Bulletin" would be complete without an appeal of some sort, here is this month's. Will all those members who have not already done so on their application forms please send us details of any special qualifications they possess, so that we shall know just where the Society stands in the way of technical resources. By "technical" we do not necessarily mean scientific: most people have some particular ability or other which will be useful in a society such as ours. There is of course no liability incurred by giving us this information. It will also help us to plan the contents of the "Bulletin" if we know in what directions our members' interests lie.

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The October Meeting.

The next General Meeting of the Society will take place at the "Duke of Yorks", Derring Street, on Tuesday October 4th., at 7.30. The resignation of the Publicity Director and Members' Representative will make necessary the appointment of their successors. After the formal business has been disposed of, Mr R.A. Smith will initiate a discussion on the practical applications of space ship design by exhibiting diagrams and drawings illustrating the Experimental Committee's current conception of a lunar space ship. In this lecture it is hoped to show that the Technical Committee have succeeded in reducing the problems of space navigation to terms of plausible engineering practice, and both they and the lecturer will be interested to discover the general reaction to them. It is intended to review these designs in the light of the criticism we hope will emerge and to publish the resultant design in the forthcoming "Journal". As this design is in a sense the king-pin of our experimental and technical programme it is of importance that we should be able to advance it with an adequate feeling of confidence in its soundness.

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The 1875 Explosives Act.

Since there has been a good deal of discussion in the past year concerning the legal position of rocket experimenters under the 1875 Explosives Act (Ch. 17, 38 & 39 Vict.) it might be of general interest to summarise the clauses of the Act that are likely to affect anyone wishing to experiment with solid or liquid fuels. It may be said straight away that the Act does not oppressively restrict or prohibit rocket experiments, it is an eminently reasonable piece of legislation concerned entirely with the manufacture, handling and sale of explosives, and contains nothing that is not simple common sense. Everyone will surely agree that it is desirable to prevent the indiscriminate manufacture of explosives - still more their use - and no matter how important rocket research is, it must not be allowed to become a danger to the community. We may not mind being martyrs to science ourselves, but our neighbours might object to being martyred themselves without having any say in the matter.

The firing of an oxygen-petrol motor on a proving stand, supervised by competent persons taking elementary safety precautions, is no more dangerous than the use of an acetylene welder which may often be seen working in a crowded street, and cannot legally be distinguished from the testing of an ordinary internal combustion engine. Firing a large free rocket near a residential quarter is of course a criminal act that would be dealt with by the police without invoking the aid of the Explosives Act. The firing of free rockets on deserted open ground, or in a large private estate with the owner's consent, concerns no one save the individuals responsible.

The Act applies to:- "...gunpowder, nitroglycerine, gun-cotton, blasting powder, fulminate of mercury or of other metals, coloured fires, and every other substance, whether similar to those above mentioned

or not, used or manufactured with a view to produce a practical effect by explosion or a pyrotechnic effect".

As liquid fuel motors work by combustion and not by explosion, they appear to be outside the scope of the Act; ordinary rockets come under the definition and are specifically mentioned in the next section.

No explosive must be manufactured except in a licensed factory, obeying the regulations set out in the Act. Small quantities of explosives may be made for the purposes of chemical experiment, but not for actual use. To license a gunpowder factory, it is necessary to obtain the agreement of the local authority and any neighbours who may be affected. Then, if certain regulations concerning buildings, tools, etc. are obeyed, a license may be granted on payment of a fee not exceeding £10.

Even in an explosives factory, the manufacture of certain substances may be absolutely prohibited if they are considered to be too dangerous. From time to time, Orders in Council are issued giving the names of banned mixtures. (Chlorate - sulphur combinations are prohibited under an Order in Council dated the 30th day of April, 1894. My thanks to Mr Burgess for this information.)

Apart from actual manufacture, gunpowder must not be kept on unlicensed premises, except in amounts of less than thirty pounds for private use. A license for a gunpowder store can be obtained for five shillings, provided that the safety provisions of the Act are obeyed. The same regulation applies to other explosives, except those absolutely prohibited.

Luckily, it is not necessary to pay £10 in order to manufacture explosives if one only wishes to do so on a small scale. The Act provides for the licensing of "Small Firework Factories", by which is meant factories where not more than one hundred pounds of unpacked explosives are kept at any time. Such a factory can be licensed for five shillings if it complies with the safety regulations of the Act and if the local authority raises no objections. If we can swallow our dignity and submit to a rocket being called a "small firework" this appears to be the best and safest procedure, as long as we do not manufacture any of the mixtures banned under Orders in Council. It might, however, be difficult to satisfy the local authority that the site was suitable.

Whether or not the B.I.S. will have to take the Explosives Act into consideration in the future depends on the policy it adopts. If we use only liquid fuels, mixed in the combustion chamber, it is very unlikely that the law will interfere, and if it does it will not have much of a case. Police court proceedings, if properly managed by the defendants, are a relatively inexpensive form of publicity.

Should we desire to experiment with any of the proposed solid mixtures, which are undoubtedly explosives in the ordinary sense whatever their technical description, it will be necessary to take out some kind of license, presumably one for a small firework factory as we do not want to waste £10 on a license permitting us to manufacture thousands of tons of munitions. This will take a good deal of time and trouble, at the best, and at the moment the B.I.S. is not in a position to provide a suitable site for the manufacture of explosives. Although 92, Larkswood Road has an extensive back garden, it is not precisely devoid of neighbours, who would probably object vigorously to nocturnal explosions.

The present B.I.S. policy, then, seems to be the best in the circumstances. By concentrating on work which has no element of danger, and which is not likely to bring us up against the Majesty of the Law, we are doing our best to bring nearer the time when we shall have the resources (including a suitable site) necessary for conducting experiments with solid explosives. It is certainly illegal for us to build and fire powder rockets at the present moment - a point which over-enthusiastic members should bear in mind.

In the meantime, the title "Interplanetary" is safer than "Rocket", and members who experiment with solid fuels do so at their own risk. I wish them luck.

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Monthly Notes.

With this "Bulletin" members will receive a copy of the August, 1938, "Astronaut", the Journal of the Manchester Interplanetary Society. (The February issue was sent out last month.)

We are sorry to announce the resignations of two officers of the Society. Mr Carnell, who has been B.I.S. Publicity Director since the Society moved to London, has had to drop out owing to pressure of external work, and Mr Bramhill, the Members' Representative, has had to do likewise for a time through temporary evening work. We would like to take this opportunity of thanking them both for their valuable services to the Society during the critical times after its move to London. In the meantime, Mr Day has kindly consented to act as Members' Representative, and the work of the Publicity Director has been taken over by Messrs. Temple and Clarke. The official appointments will be made at the October General meeting.

We would like to record our thanks to Mr Stephen S. Smith for a copy of the Bulletin of the Indian Air Mail Society just received from him. It contains a full report of his rocket mail experiments in June and July, an account of which is given on page 12.

We are glad to welcome to the B.I.S. Mr T.L. MacDonald, Director of the Lunar Section of the British Astronomical Association, who has promised to contribute to our forthcoming publications. If any members have telescopes and would like to help Mr MacDonald in his lunar researches, will they write to us? If we get enough replies, we may be able to start an observational section in the B.I.S.

We also welcome the following new members: Messrs. E.A. Ellison, Eccles; D.H. Neal, Coulsdon; D. van Vlymer, London, and A.C. Scribbams, Birmingham.

Chingford Chiaroscuro.(A layman's first Experimental Meeting.)

by

William. F. Temple.

It was Arthur Clarke who persuaded me to attend an Experimental Meeting at Headquarters. Being about as practically minded as a surrealist opium-eater, I'd hitherto shied at being involved with a lot of people who shot expressions like "adiabatic expansion" and "stoichiometric amount" at each other, and, moreover, seemed to know what they meant. But Arthur is, of course, the Treasurer, and my sub. being overdue I wanted to keep on the right side of him.

But he was on the right side of me on the Tuesday evening when we were walking up Larkwood Road together, en route for the meeting. I was talking brightly about my favourite subject, when suddenly I became aware that I was talking about myself to myself: Arthur had disappeared. Then I caught the glint of his spectacles down a fenced and hedged alley which ran away between the houses on this side of the road. This, apparently, was the Secret Passage to Headquarters. No. 92 is a sort of Pharisee house: "not as other houses". It stands aloof in the centre of a patch of wasteland (or am I libelling Mrs Smith's garden?) Anyway, we got inside without any process of peculiar knocks or hoarsely whispered pass-words, and were greeted by Mr. and Mrs. Smith and something outsize in the way of dogs. We proffered our little gift of ham sandwiches (we'd been trying to get rid of that ham for a long time, but the weather had been against us) and it was kindly received, except by the dog, who exited with a hurt expression.

I fell to examining an intriguing but only partially completed model of a spaceship altimeter on the table, a heavy disc of aluminium which spun smoothly on its bearings in a framework, and soon other members came trickling in: Messrs. Edwards, Ross, Bein, Day, Bramhill, Cowper-Essex and Janser. A general discussion began, which ranged from the composition of a new steel which could withstand thermit to the composition of a dog's dinner. Mr Smith, who knows only too well how these meetings persist in wandering miles from the point, called for order, and the meeting proper began. First on the agenda was the question whether to buy four small magnets for the altimeter and alter them, or continue a so far unsuccessful search for a suitably large one. It was decided to get the four small ones if their jaws could be widened by cutting.

Mr Smith had to tactfully re-direct the attention of the company from a discussion of the falling birth-rate to Item Two of the agenda: the composition of a very light but efficient battery to heat the spaceship. Here Messrs. Edwards and Janser started an argument on such a highly technical plane that I just sat there between them agape, and the stream of words passed over my head like a beautiful rainbow. I gathered it was something about conductivity values. Arthur Clarke made occasional interjections, which might or might not have been to the point, but at any rate showed us that Arthur grasped what was going on. Which was what Arthur wanted to show us, anyway. It all ended with Mr Janser promising to hunt through his books (all 2,000 of them) to find certain tables, and perhaps consult the National Physical Laboratory on this important subject. (Wish I knew what subject.)

After this, the talk turned to the firing system of cellular rockets, anti-aircraft and life-saving rockets, Hitler and the Nazi regime, and then split so many ways that I couldn't keep tag of them. Mr Edwards has a habit of outlining home-made gadgets of a super-Heath-Robinson nature at a moment's notice (and often

there's real sense in them if you analyse them), and now his fertile mind threw off a little invention for drawing rocket performance curves with the greatest of ease. The heart of this brain-child, a proving stand, was an ink-bag that squirted graphs onto a peculiarly shaped revolving drum.

The company was wallowing in methods of running a bag-wash when the determined Mr Smith grimly dragged the focus of attention round to Item Three: the COEL-ECOSTAT. (Let it always be written in capitals, for the invention deserves the greatest respect. Besides, it shows I can spell it.) It's a neat little trick, all done by mirrors. There are two fixed ones, and two that revolve. The idea of the thing is to give observers in a spinning spaceship a stationary view of their surroundings for navigational purposes. (The spaceship must revolve on its axis throughout the voyage to provide artificial gravity, and also for maintaining a straight course through the atmosphere after the take-off.)

Mr Edwards started to make a cardboard model of the instrument. He wanted some scissors. Mr Bein produced them like magic from his pocket. He wanted a needle. The amazing Mr Bein carried one of those, too. But Mr E. wasn't satisfied with the model alone. He wanted to demonstrate the fundamental principles of the thing. He called for mirrors. Here Mr Bein modestly pretended he was beaten. The place was combed for mirrors. Mrs Smith produced her powder-compact. Mr Smith his shaving mirror. People kept wandering in with wall-mirrors and hand-mirrors and great slabs of mirror lifted from dressing tables. The room scintillated.

Mr Edwards disappeared into the midst of a huge pile of mirrors, and was not seen for some time. Only occasional curls of tobacco smoke drifting up showed that somewhere in that mirror maze life still existed. Presently his beard was observed to emerge from the N.E. corner, and Mr E. followed it closely, clutching the

powder-compact. This was to be the viewing mirror. Mr E. placed it carefully on the piano, and commissioned other people to stand around it holding mirrors at various angles to represent the framework. Soon the room was full of living statuary, standing in graceful and artistic poses holding mirrors above their heads.

Mr E. squinted into his compact and complained that he could see nothing but the ceiling. He twisted it around, and still saw the ceiling. He peered into it upside down, and saw - the ceiling. Fatigue began to overtake the living statues. Wobble set in. Here and there a member collapsed with a thud on the carpet, and lay twitching amidst the splinters of his mirror. But kind-hearted Mrs Smith took over the role of Florence Nightingale, and came among the stricken Interplanetarians bearing a tray of tea and sandwiches. Gratefully I accepted my share of the refreshment, and took a hearty mouthful of sandwich before I realised that it was my late ham come back to me. That was the unkindest cut of all.

I have no time to tell of the astonishing contortions of Mr E. pursuing the mirror image of a pencil through four angles (he juggled simultaneously with a mirror, a pencil, a protractor, a cardboard model, a long cigarette holder and a cigarette, and his own reflection of all this in the mirror), nor of the serious discussion on bed-bugs, rabies, ice-cream and barnacles that followed. It was decided to construct a working model of the coeleostat, and also to get out designs for a proving stand. Then the meeting broke up.

And if anyone believes that this account is in the least exaggerated, let them come and see for themselves any Experimental Tuesday evening (it's the fourth Tuesday in each month) at Number 92. Each and every B.I.S. member is welcome at these meetings: they are intended to interest the members in the practical side, and if possible to recruit some of them to do odd jobs. Anyway, that is the plea which is always brought up in their defence.

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NEWS ITEMSIndian Rocket Transport.

At Alipore, India, on June 26th., very successful flights were made by three of Mr Stephen Smith's mail rockets, Nos. 164, 165 and 166. Each of these rockets was carrying over a hundred special letters, and they were fired by the Postmaster and Deputy P.M.G. Mr Smith is experimenting with mail rockets as a means of speedy transport in flooded districts, and during the monsoons. The "Star of India" describes the speed of the rockets as "terrific".

Another series of tests was carried out on July 24th., when rockets Nos. 171, 172 and 173 were fired. Mr Smith was again very successful, the rockets making spectacular flights. Writing of one rocket, the "Star" says: "On leaving the firing rack, it almost immediately disappeared from view, its trail of smoke indicating the course taken".

Mr Smith is stated to be now at work on a boom-erang rocket, which will drop parcels containing food or medicines while in flight, returning to the firing point after taking photographs.

Jupiter's New Satellites.

Mount Wilson Observatory announces the discovery of two new satellites of Jupiter, Satellites X and XI. They were discovered on photographic plates taken by the 100" reflector, and are the first new satellites to be discovered since Nicholson detected IX in 1914. Their magnitudes are about 19, and they are thus among the faintest bodies in the solar system. Their distances from Jupiter are not given, but presumably they are further from the planet than VIII and IX, which are both at a distance of 14,000,000 miles from their primary.

Jupiter now takes the palm from Saturn as the planet with the greatest number of moons, though probably both planets have many more satellites of still smaller magnitudes.