

SPACEWARDS

Official Organ of the Combined
British Astronautical Societies

ONE SHILLING—NON-MEMBERS

Edited by: K. W. GATLAND and E. BURGESS



—Courtesy F. J. Field, Ltd.

GERHARD ZUCKER during a demonstration of his powder fueled "controlable aerial torpedo" before the German military in 1931.

EDITORIAL COMMENT

The London meeting of the C.B.A.S., which took place on January 20th marked the beginning of what should prove to be an eventful year for the British astronautical societies.

This, the first assembly of the Southern Counties group for nearly three years, was reserved for the purely technical member, and there was present a very fair representation of technicians; including members of both sections of the C.B.A.S.: the Farnborough branch and the B.I.S.

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Contributions are invited for Publication in this Journal, but the Committee wish to state that they do not necessarily agree with opinions expressed in such contributions when published.

Communications should be addressed, c/o Hon. General Secretary, C.B.A.S., Southern Headquarters, 17, Southcote Avenue, Tolworth, Surbiton, Surrey.

The C.B.A.S. Central Council has approved the calling of an Extraordinary Meeting for the purpose of discussing the proposals outlined in the Farnborough Recommendation, which Mr. Davidson presented at the London Technical Meeting—see report, Page No. 8. This further meeting, which it is hoped to convene early in April, is to be preceded by similar meetings, at Manchester and possibly Birmingham. The minutes of these will be read at the main London assembly, where their respective votings will be taken into account in the final voting assessment. Early notice of the date and place of these meetings will be given in the Society Bulletin.

THE IDEAL ASTRONAUTICAL SOCIETY

(by Arthur Clarke)

Now that the war is coming to its end, it is high time that we took council with ourselves and decided precisely what sort of society we need and how we hope to achieve it. The transition from war to peace will be gradual and will take several years, so it may not be possible for all our plans to come into operation with the armistice. But it is essential that we have a clearly defined goal before us, and this article is one person's attempt at such a definition. I certainly do not expect that everyone will agree with my views, but I do hope that they will help others to form opinions of their own.

Firstly, the post-war society must have a name which expresses its purpose in a clear and if possible euphonious manner. Since we are till a long way from the World State, the word

“British” should appear in the title to prevent confusion with societies in other English-speaking countries. This leaves us with a choice between British (Astronautical) (Interplanetary)—(Association) (Society). B.A.A. has much to commend it, but the British Astronomical Association might reasonably object. Also the word “astronautical” is still rather uncommon and few people realise its meaning. In the writer’s opinion, the old title British Interplanetary Society cannot be beaten, and in addition it is well known and its implications understood.

The society must include all existing organisations for only then can it be regarded as the national authority. It will therefore be necessary for the existing three societies to amalgamate as soon as possible into the new organisation.

It should be our aim to increase the prestige and weight of the society until eventually it is regarded with the same respect as, say, the R.Ae. S. To do this, full membership should be strictly limited to individuals of proved technical or other ability, and the rates of subscription should be brought into line with those of other learned and professional organisations. I would go so far as to suggest that members should only be admitted to the higher grades after producing academic or equivalent qualifications, such as a thesis on some subject allied to astronautics. Only thus is it possible to detect and repulse the lunatic fringe of astrologers and cosmic clairvoyants who are irresistibly attracted to an organisation such as ours.

The society should aim at publishing a monthly “Proceedings,” but that will clearly be impossible for some years, not only for lack of money, but more fundamentally for lack of material. However, it is essential to issue a Bulletin once a month, as well as a Quarterly Journal. The function of the Bulletin should be to keep the members informed of meetings and current developments: the Journal would deal with matters of permanent interest and would be aimed at a much larger circle than the society’s own membership. Copies would go automatically to other societies, to libraries and to the Universities.

It is not possible to overestimate the importance of the Journal, and to a lesser degree of the Bulletin. For most of the members, it will be their only link with the activities of the organisation and so it should be informative, well written and in all ways a publication of which the society could be proud. The prestige of the society in the scientific world will depend very largely upon it.

Administration is the weak point of most societies run by voluntary effort, and when the society is large enough a full-time paid secretary is essential. Technicians will not be bothered to keep records and minutes, nor to deal promptly with correspondence. (The witer, of course, is one of the exceptions to this rule). They must be continually harried by a ruthless personality—someone of the calibre of Tommy Handley's Miss Hotchkiss. But the subject of the internal organisation of the society, which is linked up with its constitution, is far too large to go into this article.

I have purposely left until the end the most important matter of all. Granted the existence of our society, what should be its aims and how should it set about achieving them? Here it is necessary to steer a middle course between goals which are wildly impossible and those which are so limited that they excite no enthusiasm.

Let us first be clear on one point. No society will ever build a spaceship. It costs the Nazis millions of man-hours and hundreds of millions of pounds to build the first rockets which reached space. All any society can do is to correlate work in fields related to astronautics, to promote interest in and discussion of the subject, to act as a clearing house for knowledge and a meeting place for those interested in the art.

Rocket research has now reached such a state that no further work along the main lines of development can be done except by large commercial or governmental organisations. The next step in design—the very high altitude sounding rocket—is going to cost many hundreds of thousands of pounds and considerable engineering resources..

Is this a discouraging picture? I don't think so. The R.Ae.S. does not build aeroplanes. The Interplanetary Society will not build spaceships, but its members—the professional engineers, the astronomers and mathematicians—will do so. And then they will write all about it in the Journal. It is, after all, the same with most professional societies. They are concerned with recording and assisting the work of their members, not with doing that work themselves.

There are exceptions, it is true. One is the American National Geographic Society, which is so rich and has such prestige that it can finance and organise expeditions all over the planet, as well as above and below it. It was responsible both for Dr. Beebee's bathyspere descents and the flight of "Explorer II." Perhaps when we have a few thousand members, we might be able

to combine resources with the N.G.S., which will soon have to find new worlds to conquer.

This, then, is the future as I see it. For many years the society can hope to do little but increase its membership and prestige. It must make no rash promises which competent authorities know to be beyond fulfillment, and it must avoid all stunts and cheap newspaper publicity. It must, at least to the outside world, appear sober and dignified. (What goes on inside may be quite a different matter: the old B.I.S. was very fond of an occasional leg-pull and some of the reports of the Technical Committee very properly never saw the light of day). Eventually, it must become recognised as an authoritative body on the same footing as the I.E.E., the B.A.A., the R.S.A. or even the B.A. itself.

The way ahead is a long one: it will not be free from obstacles or disappointments. But the time will come, and perhaps sooner than we think, when our society will have to play a role more ambitious than anything we ever dared to imagine. We cannot evade our responsibilities. The foundations we lay now, and the ideals we form in our own minds, may help to shape the futures of more worlds than one.

For Radio Enthusiasts

A radio type of altimeter was proposed several years ago by N. Carver of the American Rocket Society. As far as is known experiments have not been made with this scheme and it is, therefore, suggested that those members of the C.B.A.S. who have the facilities, should participate in a series of tests.

The scheme was to have two oscillatory circuits, one employing a condenser having a mica or other constant dielectric, and the other with a condenser having air as a dielectric. Variations in the pressure, humidity and temperature of the air would cause a frequency change in the second oscillator. The beat frequency of the two oscillators would give a direct transmission of the atmospheric conditions during the flight of a sounding rocket. Experiments that can usefully be performed will be the construction of these two oscillators, and measurements of the beat frequencies for different values of atmospheric pressure, humidity, and temperature. Members interested in this work are requested to contact the President at Northern Headquarters..

REPORT OF ORDINARY GENERAL MEETING of the C.B.A.S. (Northern Branch) held at 7.0 p.m. on Friday, 15th December, 1944, in Room 3 of the Manchester Adult Educational Institute, 49, Lower Mosley Street, Manchester, 2.

The meeting was opened by the Chairman, Mr. E. Burgess, calling upon the Northern Secretary, Miss Y. Cusack, to read the minutes of the last meeting. These were duly approved and signed as correct.

The elections of 16 new members were confirmed, and it was announced that there had been 22 new members in the Southern Group during the same period of three months. Following this, Miss D. H. Burgess gave details of the meeting at Wallasey between Mr. P. E. Cleator, F/Lt. A. C. Clarke, the C.B.A.S. President, and herself. (This meeting was reported in the Supplement to the December Bulletin.—ED.) The President then proposed that the present wartime subscriptions be increased by 2/6 per annum, per member to cover the cost of improved publications. This motion was unanimously carried by the meeting.

Mr. D. A. Peat was then elected as the third member of the Northern Committee, and Mr. A. E. Crawford, was elected to Fellowship from membership..

Mr. Mitchell then proposed that a group be formed at Eccles near Manchester. He stated that there were several members in that neighbourhood, and that facilities would be available for them to hold frequent meetings and to assist with research or other work. In reply to the suggestion, Mr. Burgess stated that he could see no objection to the formation of this group, and the proposal was formally approved by the meeting.

After several other administrative matters had been dealt with, the Secretary then called upon the President to read his paper entitled "ROCKET FUELS AND INTERPLANETARY JOURNEYS." At this point the meeting changed from Room 3 to the Institute Library, and the talk commenced.

Mr. Burgess started with a quotation from an old B.I.S. pamphlet concerning the possibilities of interplanetary travel, and then proceeded to the mathematics regarding the derivation of the main equations of rocket motion. These included the calculation of escape velocities for different planets and their satellites, and the well-known exponential law of rocket flight. The mass ratio rule was also discussed in some detail, and this was followed by the calculation of theoretical efflux velocities for various fuels. Efficiencies were discussed, and the President

finally condensed some of the rather unwieldy equations to compact practical forms.

It was pointed out that present day fuels can only yield jet velocities in the neighbourhood of five kilometres per second, and it was stated that the remainder of the lecture was drawn up on the assumption that fuels giving an efflux velocity of this figure are to be employed. The lunar journey was then analysed, it being shown that a return trip to our satellite would require a mass ratio of 229.1. The matter became rather complicated, however, when the weights of fuel tanks and motors were taken into consideration. Building up the journey, step by step, Mr. Burgess proceeded to calculate the amounts of fuel that would be required for the various stages of the lunar journey, finally showing that the spaceship would probably consist of 1,637 tons of fuel, 82 tons of motors and fuel tanks, and a one ton life container. He stated that by using all manner of dodges, these figures could be considerably reduced, but that the problem still remained quite formidable. He then showed how simple the whole thing would be if fuels having greater jet velocities could be employed. A jet velocity of 10 kms/sec. would reduce the mass ratio from 229.1 to 14.79, and 30 kms/sec. would further reduce it to 2.45.

The President then concluded his paper by showing the various mass ratios needed for voyages to the other planets, and stated that refueling stations on the various planets and satellites, even with present day fuels, could make interplanetary travel as commonplace as flying is nowadays.

Very many points were raised in the discussions following the lecture, and included efficiencies, uses of radio, stability of fuels and the landing and take-off from the lunar surface. Miss Cusack then proposed a vote of thanks to the lecturer, which was seconded by Mr. Page and carried.

The meeting was opened for general discussion and was not terminated until 10.0 p.m.

**REPORT OF TECHNICAL MEETING of the C.B.A.S.
(Southern Branch) held at 7.0 p.m. on Saturday, 20th January,
1945, at Islington, London, E.C.4.**

A particularly good attendance of technician members marked the opening of a new London meeting programme organised by the C.B.A.S., Southern Counties group. Among members of the Control Council present, were the President, Mr. E. Burgess who travelled from the north specially for the occasion, the General Secretary, K. W. Gatland and A. M. Kunesch. The founder of the Farnborough group, Mr. J. Humphries organised the meeting, and there were a large number of Farnborough members present. Representing the B.I.S., we were pleased to welcome Professor A. M. Low, R. A. Smith, A. C. Clarke, A. V. Cleaver, A. Janser and H. Ross. Of the twenty-four technicians in attendance, two were lady members.

Mr. J. Humphries took the Chair and in opening, emphasised that the meeting—which was of an informal nature—had been called largely to gain some idea of members views on what should be the future policy of the Society; and also, to place before the Central Council a Recommendation, comprising four proposals which would have affect on the Society Constitution.

Mr. J. M. Davidson then read the Recommendation—which had received the signatures of thirty-five representative members

Although the C.B.A.S. have done much in Great Britain to further interest in the field of Astronautics, it is felt that, if the single institution which must inevitably arise from their amalgamation is ever to attain a position amongst the leading scientific and technical societies and institutions of the world, drastic changes must be made to the policy and in particular to the constitution of these societies. Moreover, it is felt that the time to make these changes is now, whilst the membership of the societies is as yet small and the influence which their policy can exert on the course of world events infinitesimal.

It is therefore strongly recommended that, within the period of three months ending on the 30th April, 1945, an Extraordinary General Meeting be called by the Central Council of the C.B.A.S., not less than one month's notice being given to all members of the Societies of the time and place of, and reasons for, this meeting, in order that the following points may be proposed, seconded and voted upon.

- (1) Redefinition of Membership.
- (2) Raising of Rates of Subscriptions.

- (3) Formation of a Technical Advisory Committee.
- (4) Formation of a Public Relations Committee.

The evening's first speaker was Professor A. M. Low. He made the point that public prejudice and government apathy of those interested in rocket development had put this country at a considerable disadvantage with our enemy, who had succeeded in developing the military rocket to an alarming degree. Professor Low drew several interesting parallels from his own wide experiences—he himself had pioneered remote control and its implications to pilot-less warcraft as early as 1917; he had also submitted original specifications for rocket artillery, which had been totally ignored by the authorities; similarly, the B.I.S., in their approach to the Air Ministry, were informed that the reaction motor could never become a serious competitor to the piston/propellor power combination. All this while rocket research in Germany was prospering:—"V-2" could not be said to be wholly the result of war-time development; it was the result of years of accumulated experience, of which, the German Societies contributed a very large part.

Continuing, the Professor went on to say that in a Society such as our own, keen members of general experience should be judged equally as important as the specialist technician—he said that the ideals of the Society were such to interest every citizen. Unfortunately public prejudice was part duplicated today, especially in view of the advent of "V-2"—to offset this, the Society should aim at interesting the people in the possibilities of the mail and the exploratory rocket.

In concluding, Professor Low paid a high tribute to the Society, saying that it was one of the greatest things he had the honour to be connected with.

Following, A. C. Clarke commenced by giving a brief resumé of the formation, and development of the British Societies. He said that the British Interplanetary Society had been largely responsible for bringing about a wide-spread understanding of the interplanetary idea in this country—even today, over five years after the dissolution of the Society, when the public talked about rockets, it invariably referred to the "British Interplanetary Society"—the work of the group must have had a considerable effect.

When the B.I.S. went into "cold storage," Clarke continued, all members were asked to write to a rendezvous address at the conclusion of hostilities. These plans still stand, although the general picture had changed considerably. The A.D.S. was formed and with the head-start given by the pioneer work of the B.I.S.,

and the immense development of the rocket in this war, had made great progress in conjunction with its partner the M.A.A. These groups, now the C.B.A.S., have today twice the pre-war membership of the B.I.S., and I am sure we all feel grateful to them for the way in which they have kept interest in astronautics alive in this country during the war. Relations between the B.I.S., and the C.B.A.S. have always been very good, and most of us (B.I.S. members) belong to both societies, so that, after the war, there is nothing to stop us continuing amicably as affiliated groups. Continuing, A. C. Clarke questioned the policy of having in being three societies, all with the same objects and so mutually, even if unintentionally, competing. He said that what he would like to see is a single, national organisation which would be recognised by everyone as *the* authority on astronautics. Competition is often a virtue, but while astronautics was still at a mere subsistence level—as it is likely to be for some years—we could not afford it. A society is crippled by its overheads until it has something like 150 members. After that, things become more hopeful and there is money for other projects. Combined, we should be able to reach the 500 mark within a few years—"1,000 members by 1950" should be our motto.

The speaker then went into the matter of prestige. The public is confused by the existence of a number of societies, he said, and so doesn't take any one of them seriously. But a single large society demands, and gets, attention. I want to avoid the state of affairs that seems to exist in the U.S., Clarke continued, where there are at least four societies to my knowledge. Maybe America is big enough to stand it, but Britain certainly isn't.

It will be necessary for all three societies to make some concessions if unity is to be achieved. In this, we should be guided by the consideration: is this good for astronautics?—and not: is this good for my society?

Clarke then went on to say that, speaking for at least three officers of the B.I.S., including the founder, P. E. Cleator; it was not their wish that the post-war coalition should become known as the "British Interplanetary Society," in the event of a better title being found—but was there a better title? The speaker said that in his opinion, "astronautical" was more dignified than "interplanetary," but that the word was almost unknown to the general public—it lacked the directness and punch of "interplanetary," and far worse, the press were quite liable to confuse the word with astrology.

Finally A. C. Clarke read the draft announcement concerning the organisation of the post-war Society. (This joint

C.B.A.S./B.I.S. statement appears in the current C.B.A.S. official Bulletin).

The Chairman next called upon E. Burgess, the C.B.A.S., President.

In opening, the President voiced his approval of the previous speaker, but emphasised that these were two distinct aspects to consider—was it possible, for instance, to combine the function of a “rocket” society with that of an “interplanetary” society?—surely, one must develop from the other.

I am all in favour of one large coalated group, he continued—the C.B.A.S., has shown the first positive step towards total unification. The prime object of the group during the war period had been to form the basis for the coming national organisation, and when it is considered that the burdens of administration had been borne by so few, the amount of work that had been done was highly creditable. Events had changed the Society completely, eighteen months past, he went on, saw our combined numerical strength at 75—today, this figure is well in excess of 200, and applications were still increasing.

Under such circumstances, the mimeographed publication had proved hopelessly inadequate—in the past, the production of both the Journal and the Bulletin had been made officials of the Society. With the present membership, this would be absolutely impossible. Professionally produced publications were the only answer, but these were expensive, and the Society funds were not adequate to cover printing costs. In fact, the present subscription scale—which, the President stressed, was only adequate in the early days of the Society—could hardly be expected to fulfil present day requirements. There was a definite need for a revision of membership dues, but at the present time, such a step was difficult to execute—it would entail considerable clerical work, which was heavy enough now without any added burden. In any case, it was particularly unwise to alter the subscriptions now, and then later—when the coalition had been made complete—find it necessary to alter them still further. In fact, this matter of limited finance was a severe problem not easily countered. The advent of “V-2” would tend to make any further practical research by the societies rather meaningless. Research must be backed by huge sums to achieve any useful, and truly progressive result. It would appear far more profitable to organise the Society on similar lines to the Royal Aeronautical Society; with discussion, and coalition of data and information, the group's chief function. These matters demand very careful consideration, continued the President, for it will be upon the policy decided with in the next few months

that the future existence of our science in this country must depend.

Following the President, the Chairman introduced Mr. A. V. Cleaver, who had recently returned from a visit to the U.S.

Mr. Cleaver opened an interesting talk by relating his discussion with Willy Ley (author of recently published "ROCKETS," and pioneer member of the German VfR) whom he had the pleasure of meeting while in New York. The speaker went on to say that Ley—before the official release—did not regard "V-2" as a weapon the Germans actually intended to use; he maintained that the Germans were much too sensible to develop such a weapon; though he agreed that it could be done. During the proceedings, it was in fact made perfectly clear that "V-2" was in use—but to continue. Mr. Cleaver next turned to the U.S. rocket societies. He commented that the American Rocket Society had largely discounted the interplanetary idea—their main interest now was the military rocket. He mentioned that, as an interplanetary enthusiast, Ley did not approve of this—although as an interim step, he was greatly interested in the meteorological aspect of rocket development.

Commenting on the number of rocket groups existant in the States, the speaker remarked that liason between them was almost non-existant, and none seemed to have any definite policy. The "United States Rocket Society," were the sole body with the ultimate ideal heart. This body—organised by R. Farnsworth, with whom Mr. Cleaver also talked—had a widespread membership, and was soon to publish a regular Journal. He mentioned that Mr. Farnsworth was anxious to contact rocket enthusiasts in this country, and would also be glad to accept articles for his new publication.

Mr. Cleaver remarked that in his opinion, the U.S. should have one society, as a coalition of all the existing bodies could well result in a large, and authorative organisation, more especially since the science was still very much in the infant stage.

The speaker next turned to the British societies. He emphasised that the national astronomical groups should have as large a membership as possible. The larger the national body was, the greater would be its influence on public opinion—and no body such as ours would progress far if public opinion was against it. However, the Society should be primarily a technical body—against this, the group would not hope to conduct any great research because of limited finance. The most useful purpose the Society could serve was to organse discussion, coalite data

and to further the science by mathematical investigation, and preliminary layout work.

The situation in the U.S. today was in many ways similar to that in Britain. All groups were endeavouring to fulfill vague programmes, which were now being executed, under far more favourable conditions by the Government laboratories.

We *must* have one Society, the speaker concluded, and all personal ambitions, prejudices, and previous attachments should be fore-gone in order to gain full agreement.

Finally, Mr. Cleaver mentioned that while in the U.S. he had met Mr. Bucham, who had kindly given him an interesting collection of photographs, illustrating the work of the VfR which were passed round among the members present.

Following a brief interval, in which photographs of the assembly were taken by Mr. P. Wallis (C.B.A.S.), Mr. Davidson (Farnborough) again read the proposal, which he had introduced earlier, for the benefit of members who had not then arrived.

The discussion which followed found general agreement in most of the suggestions contained in the paper; but the point regarding notices released to the press caused some disunion. The proposed Advisory Technical Committee—which would sanction official statements by Society officials, signed on behalf of the Society—would mean loss of valuable time. Nevertheless, it was a good scheme, but like the other points raised, one that would have to be judged at a full members' representation.

The majority of members present did not appear to have any clear idea of just what the national body should be—should the proposed Society aim at the development of the rocket motor, or should it become purely an interplanetary minded group? Mr. R. A. Smith, commenting upon the matter, said that the future of astronautics was yet subject to doubt. The subject may develop on different lines—it was not yet possible to decide in any way fully, future policy. It was possible for a technical group to get too wrapped up in itself—he agreed with Professor Low that the Society must not get out of touch with public opinion. But the national body should have interplanetary communication as its prime interest; not the development of rockets.

The General Secretary, Mr. K. W. Gatland, then introduced a proposal that the Society should endeavour to interest a publisher in the production of a journal concerning rocket development, of similar standing to "FLIGHT." He said that this suggestion had been made on several occasions by Society members. The general reaction to this proposal was that, although the idea was

a very favourable one, it was somewhat premature, and, in any case, the existing journals could effectively cover present needs. At the moment, it was thought, such a publication would have a limited appeal.

The Chairman brought the meeting to a close by calling for the inauguration of a fund for the development of the Society's publications. This was readily agreed by all present; members' donating a total of £13 11s. 6d.—a very creditable amount. (It is hoped that all Society members will respond to this appeal, and the address to which contributions should be sent is, Mr. A. M. Kunesch, 28, Alexandra Drive, Tolworth, Surbiton, Surrey).

The meeting was officially terminated at 10.0 p.m., although small discussion groups continued until sometime later.

During the evening, the combustion chamber, and nozzle former of the cartridge feed, pulsating motor—now under construction by Mr. Kunesch—were shown, and caused considerable interest. It was expressed that the motor should be completed, and ready for test, within the next three months.

WANTED. Messages, Labels, Propaganda material, Correspondence, etc. relating to mailing experiments by reaction flight—especially items associated with Tiling, Schmiedl, and American pioneers. Liberal prices paid.

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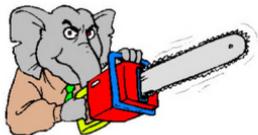


**FRANCIS J. FIELD, Richmond Road, Sutton Coldfield,
Nr. Birmingham.**

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