SCIENCE

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MSS. intended for publication and books, etc., intended for review should be sent to Professor J. McKeen Cattell, Garrison-on-Hudson, N. Y.

POPULAR SCIENCE LECTURES[1]

INTRODUCTION

AT the meeting of the council in June, 1916, representations were made by the organizing committee of Section L (Educational Science) that much less attention is given to popular lecturing now than was formerly the case; and it was suggested that efforts should be made to promote increased public interest in science by means of such lectures. The council, therefore, appointed a committee representative of all the sections of the association to institute inquiries into this subject and prepare a report upon it. Many local scientific societies, universities, university colleges and similar institutions have organized popular science lectures; and the committee has endeavored to secure the results of the experience obtained, with the object of discovering the elements of success or failure.

A schedule of twelve questions was drawn up and was widely distributed. To prevent misunderstanding, it was pointed out in an explanatory letter that the committee was concerned only with single pioneer lectures for the general public, and not with students' courses, such as are arranged by university extension authorities, the Workers' Educational Association and other organizations.

[1] Report of the Committee of the British Association for the Advancement of Science consisting of the president and general officers, Professor H. E. Armstrong, Professor W. A. Bone, Sir Edward Brabrook, Professor S. J. Chapman, Professor A. Dendy, Professor R. A. Gregory (hon. sec.), Professor W. D. Halliburton, Dr. H. S. Hele-Shaw, Professor F. Keeble, Mr. G. W. Lamplugh and Dr. E. J. Russell, appointed by the council to consider and report on the popularization of science through public lectures.

A circular containing the schedule of questions was addressed to (1) principals and registrars of all universities (except Oxford and Cambridge) and university colleges in the United Kingdom; (2) principals, or directors, of all technical colleges represented in the Association of Technical Institutions; (3) secretaries of every university extension delegacy or board, of the Workers' Educational Association, the Gilchrist Trust and like organizations; (4) secretaries of all corresponding societies and of forty other local scientific societies; (5) curators of the chief provincial museums; (6) a few individuals having special knowledge of the subject.

By the middle of August, about 150 circulars had been returned, nearly all of them containing replies to the questions and also many valuable comments. The whole of these replies—about 1,500 in all—have been classified, and a digest of their substance is here given. The first question asked for the name of the society or institution providing the information.

ABSTRACT OF REPLIES TO QUESTIONS

2. *Are arrangements made for the delivery of public lectures upon scientific subjects each session? If so, (a) are the lectures free? (b) What are the lowest and highest charges for admission?*

In most cases local scientific societies arrange for the delivery of occasional popular lectures each session. These lectures, however, are not usually intended for the general public, but for members of the societies and any friends who may accompany them. The lectures are thus more of the nature of scientific meetings than public assemblies, and the fee for admission to them is the membership subscription, which varies from 1 s. to a guinea per session. In a few cases one or more public lectures are arranged each session, and admission to these is free, or at nominal charges varying from 1 d. to 6 d.

Series of public lectures are arranged by several corporations in connection with museums, libraries and other institutions, as well as by universities and technical colleges. The annual series of corporation free lectures at Liverpool includes scientific subjects; at the Horniman Museum, Forest Hill, S.E., twenty free lectures are given on Saturday afternoons from October to March; at the Manchester Museum, sixteen public lectures are arranged each year; at the National Museum of Wales, Cardiff, lectures are given from time to time in connection with special exhibits in the museum; at the Technical School, Barrow-in-Furness, a course of popular lectures is delivered on Saturday evenings; and at the museum, free library and Bentlif Art Gallery, Maidstone, free popular lectures were successfully arranged every winter before the war. The secretary of the Buchan Club, Aberdeen, remarks of public lectures:

> They were formerly given until they declined for want of suitable lecturers and variety of lectures.

And the principal of Battersea Polytechnic says:

> We have discontinued the arrangement of popular lectures as the attendance was discouraging. We have found that the people in this district will not attend popular lectures, whatever the subject. We have offered lectures by such men as Max O'Rell, E. T. Reed, T. Foster Fraser, T. P. O'Connor, Sir J. D. Maclure, F. Villiers, Fred Enoch and H. Furniss; and the response of the public was disappointing, although the charge for admission was only 3 d. We arranged for a lecture on "Air-ships" in the spring of this year, but failed to secure an audience and had to cancel the lecture.

3. *Where are the lectures usually given? (a) What is approximately the average attendance?*

Lectures given in rooms of museums,

public libraries, universities, technical schools and like institutions, attended by members of scientific societies and their friends, have usually audiences of about 30 in number, and the limit of accommodation does not often exceed about 200. The average attendance of the whole of the lectures, of which particulars have been received, is about 300. In the town hall, Stockport, the average is 1,250, "but this is a decreasing number;" at the Mechanics' Institution, Burnley, it is 800–1,200; at the town hall, Portsmouth, 500–2,000; at the Merchant Venturers' Technical College, Bristol, 600–800; at the Birmingham and Midland Institute, 700; at the Albert Institute, Dundee, 500–800; at various towns distributed through England, Wales and Ireland the average attendance at Gilchrist Lectures is about 600; and at the Geographical Institute, Newcastle, about 500.

4. *What subjects attract the largest audiences?*

From the point of view of local scientific societies, the most popular subjects are local archeology and antiquities, animal and bird life, and other aspects of natural history. The most popular public lectures are those on travel and adventure by explorers whose names are widely known. Astronomy is rarely mentioned, but this is probably because local scientific societies are mostly concerned with natural history and there are few good lecturers on astronomy. Science lectures must be illustrated by lantern slides or experiments if they are to appeal to a large public, and their titles should arrest attention. The chief point, however, is that lectures should deal with recent discoveries or topics which have been mentioned frequently in the daily newspapers. The largest audiences are usually attracted not by descriptive lectures on such subjects as mimicry, the descent of man, prehistoric animals, trade processes, and so on, but by those which are concerned with questions of wide economic or sociological interest, such as industrial research in America, wireless telegraphy in war, the wages problem, munitions of war, etc. One correspondent says:

> Purely scientific lectures do not attract, however eminent the lecturer. The most attractive lectures are the least scientific.

5. *Do you attach as much importance to the lecturer as to the subject?*

As much, or more, importance is usually attached to the lecturer as to the subject. Most of the replies are in this sense, and the following are typical of them: "The society does not, but the audience does;" "In order to attract subscribers, the chief importance is attached to the personality and celebrity of the lecturer;" "The lecturer practically determines the audience;" "Undoubtedly, if the lecturer is well known;" "Yes, more, for popular lectures;" "More to the lecturer, if known: if not known, to the subject." The best combination is, of course, an attractive subject and a celebrated lecturer, and the public soon forms its own estimate of the two factors. "The subject attracts in the first instance, but a poor lecturer would not draw a second time."

> Under the conditions here [Forest Hill, S.E., Horniman Museum], where there is a large population to draw on, title and subject are probably more important than lecturer. Nevertheless, some lecturers are always fairly sure of a good audience, and a series which begins with lectures by relatively poor lecturers soon suffers a reduction in size of audiences.

In many cases the lectures are given by members of the staffs of local museums, universities, or other institutions, but this limitation of choice of lecturer and subject soon exhausts the public interested in them.

6. *Are lectures by strangers generally more or less successful than those by local lecturers?*

When the visitor is a celebrated lecturer,

it is natural that larger audiences should be secured than in the case of local lecturers. Probably strangers are not invited to lecture unless they have more than a local reputation, and this accounts for the general opinion that they are more successful as regards size of audience. Typical replies to this question are: "Lectures by strangers, especially when they are celebrities, are far more attractive;" "Yes, as they are usually well-advertised; otherwise, I doubt if the numbers would be increased;" "Except for lecturers of world-wide fame, we find the attendance about the same for local lecturers as for outside lecturers;" "A known name, local or otherwise, is generally more attractive than that of a completely unknown person;" "Strangers distinguished in literature, science or public life generally attract good audiences. In the case of scientific lectures, local lecturers appeal more to the general public owing to the fact that it is a difficult matter for an outside lecturer to provide adequate experiments. The majority of these lectures in the past have been delivered by our own staff" (University College, Nottingham). "It depends on the lecturer; when a local lecturer lectures repeatedly in the same district he ceases to draw really large audiences" (Manchester).

The general conclusion seems to be that for lectures to local societies, with audiences numbering from about 30 to 100, local lecturers "draw" as much as visiting lecturers of the same standing, but the visitor has to depend more upon the subject and title to attract an audience. "The fact that a prophet is not without honor save in his own country somewhat discounts the popularity of local lecturers; but a distinguished local man will attract a larger audience than a much less distinguished stranger" (Manchester).

7. *If fees are paid to lecturers, what is the usual amount for (a) Lectures with or without lantern slides, (b) Lectures with experimental illustrations?*

Few local societies have sufficient funds to pay lecturers: the result is that most scientific lectures arranged by these societies are given free or for out-of-pocket expenses. Members of the staffs of colleges and other institutions also usually give public lectures locally without fees. The general fee to professional lecturers, with lantern slides or experimental illustrations, or both, varies from three to ten guineas. Dr. Wertheimer, principal of the Merchant Venturers' College, Bristol, says, in answer to the question: "Varies with the lecturer. We have found some dear at five guineas and others cheap at fifteen guineas." The Stockport Science Lectures Committee usually pays ten guineas for a lecture, but in exceptional cases, as for Sir Ernest Shackleton and Sir H. B. Tree, forty guineas have been paid.

8. *With admission free, or at a nominal charge, and excluding the cost of the hire of a room or hall, what is the usual profit or loss upon a popular science lecture? (a) If there is a loss, how is it met?*

9. *Are any local funds available for people's lectures?*

As lectures to members of local scientific societies and their friends are usually given free, expenses are low and are met by the general funds of the societies. The secretary of the Buteshire Natural History Society says:

> Some years we have had lectures for the public for which a charge was made—about 6 d. There was usually a profit, after paying everything, of a few shillings.

There is, however, rarely a profit upon a public lecture. The Buchan Club, Aberdeen, estimates the loss at £1 to £2 per lecture, and it is paid from the funds of the society. Even with the well-arranged Gilchrist Lectures delivered in various parts

of the country, the average loss is about £10 a lecture and is met by a grant from the Gilchrist Trustees. At Stockport

the hall has been hired, with charges for admission. The greatest profit in the early years was approximately £20. In recent years there has been a loss. A number of local gentlemen guaranteed a guinea each in case of loss. No call has been made upon them.

At University College, Nottingham, the loss per lecture is from £2 to £5, but no allowance is made for the services of the lecturer and his assistant, or for the use of apparatus. In such cases the loss is met out of college funds. Lectures are likewise given in many places as part of the educational work of museums and the cost is paid out of the incomes of the institutions. When the museum is a municipal institution, or lectures are arranged by a Free Public Library Committee, any loss comes out of the rates. Thus the secretary of the Albert Institute, Dundee, says:

As the lectures are all delivered within the premises of the Free Library Committee, any charge for admission is prohibited by the Public Libraries Acts. The Albert Institute Lectures have proved so popular that they are regarded as a branch of the work of the Free Library Committee. A sum of about £25 is usually taken in the estimates of that committee for expenses—lantern operator, making slides, arranging halls, etc. All my lectures are gratuitous.

Similarly, the chief librarian of the Liverpool Public Libraries remarks:

The public libraries are rate-supported, and lectures are part of the public library work. This library was established by special Act of Parliament, and not under Ewart's Library Act. Authority was included in our Act to pay for lectures. The vote by our council for lectures during the past few years has been about £1,100 per year.

In other cases the cost of popular lectures is paid by the legal education committee or out of the grant made to the institution by the board of education.

Very few localities have special funds available for the expenses of public lectures. The secretary of the Kilmarnock Glenfield Ramblers' Society says, however: "The Kilmarnock Philosophical Society has considerable funds for providing lectures, but has not done so for many years." At Dundee,

the late Lord Armitstead gave, about twenty-five years ago, a sum to establish "The Armitstead Lectures." No local lecturers are engaged. A nominal charge for admission is made. These were formerly well attended, but latterly the attendance has fallen off. The Albert Institute Lectures now tax the full accommodation of the Albert Hall. They are absolutely free to the public.

There is at Perth a local trust fund, called the Duncan Bequest, for lectures; and at Maidstone the popular lectures are provided out of the Bentlif Wing Trust Fund of the museum, free library, and Bentlif Art Gallery. The Midland Institute, Birmingham, has a small endowment of about £30 a year for science lectures; and the Royal Technical College, Glasgow, has an endowment fund for popular lectures on astronomy. The Gilchrist Educational Trust is referred to in detail later. One of the purposes of the Chadwick Trust (40 Queen Anne Chambers, Westminster, S.W.) is to provide for "the delivery by competent persons of lectures on Sanitary Science," and a number of successful lectures have been given in pursuance of it, particularly during the war. Among the subjects of these recent lectures are: Racial Hygiene and the Wastage of War; War and Disease; Food in War-time; Typhus in Serbia; Prevention of Disease and Frostbite in the Army. The Trust pays all expenses of fees, hall, lantern, advertising and printing, though halls and lanterns are often lent.

10. *Has public interest in popular science lectures increased or decreased in your district during the past ten or twenty years?*

The analysis of replies to this question is

inconclusive. About one third of the correspondents report that interest has increased, another third that it has decreased, and the remaining third that it has remained stationary or no decided change has been noticed. Museums mostly report an increase of interest, and technical institutions a decrease. No general conclusion can be derived from the replies from scientific societies, in which so much depends upon the energy of the secretary and the constitution of the committee. For example, the Birmingham and Midland Institute Scientific Society reports an increase, while the Birmingham Natural History and Philosophical Society records a decrease.

As regards public interest in science lectures Dr. M. E. Sadler remarks: "I should say that it has increased and might be greatly stimulated by further efforts." Other replies to this effect are: "I do not believe that public interest in popular science lectures has decreased, but it certainly has less opportunities of manifesting itself" (School of Technology, Manchester). "There has been a marked increase of interest within the past five years" (University College, Aberystwyth); "In that time the public interest in our lectures has increased considerably" (Kilmarnock); "The interest in the Manchester Geographical Society's weekly lectures has greatly increased during the past fifteen years."

The chief causes of decrease of interest in many districts are indicated in the following replies: "The public interest has doubtless decreased slightly during the past ten years. This is to some extent accounted for by the fact that during recent years scholars from the secondary and other schools in the city have continued their education at the college and other institutions, attending two and three evenings per week, and therefore do not attend single lectures as in former years. The opening of picture-houses has probably also affected the attendance at lectures" (University College, Nottingham). "Decreased. The lectures are no longer novel, there is increasing difficulty in obtaining new and good lecturers, and there are many counter-attractions, *e. g.* kinema, other lectures in the same town, etc." (Stockport Science Lectures Committee). "Decreased: representatives on public bodies either have not the time (through commercial claims), or the interest, to devote any attention to the matter" (Chelmsford). "I should say decreased with the quality of the lecture. Good lectures are rare and generally well attended" (Plymouth).

The whole matter is admirably summed up by Mr. D. B. Morris, Town Clerk, Stirling, as follows:

> Comparing the position of matters now with that of thirty years ago, the popular lecture does not now occupy the place in public esteem which it did. For this there are various causes. With the better type of young persons, attendance at continuation classes, with their organized schemes of study, takes the place of attendance at popular lectures. To the non-studious the picture-house is the habitual place of resort. Many of the films there shown are such as would be exhibited at a popular science lecture.
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> As regards older people, some find that life has to be lived more strenuously nowadays, and rest or quiet recreation are sought in the evening rather than anything distinctly intellectual. The great popular interest which used to be taken in natural history arising out of the "evolution" controversy, and inspired also by the writings of Darwin, Wallace, Huxley, Lubbock, Kingsley and others, has passed entirely away. Such interest now centers in subjects like wireless telegraphy, aviation, and, at present, all matters connected with the war.
>
> Serious students will always be found to attend courses where educational value is to be got, but popular lectures will not succeed unless illustrated by kinematograph, lantern, or experiments, or by all three. The element of entertainment must be present, which implies novelty. Arrangements might be made with local picture-houses to have a fortnightly or monthly scientific evening, which

would take the form of a popular lecture with illustrations. Tickets, containing a short syllabus of the series, could be sold at cheap prices, a local organization assuming financial responsibility.

11. *Can you suggest any course of action to follow in order to increase public interest in science in your district by means of popular lectures?*

The chief needs referred to are: (1) a supply of trained popular lecturers; (2) coordination of effort of educational institutions, university extension committees, municipal corporations, trades councils, and similar bodies; (3) adequate advertisement and interesting press notices; (4) lectures dealing more especially with subjects of present-day interest, or relating to the needs of the district; (5) endowment of popular science lecturers so as to enable lectures to be provided at a moderate cost; (6) the use of the kinematograph in science lectures.

Many correspondents seem to think that popular lectures are necessarily of the instructive kind and intended to induce people to take up courses of study at educational institutions. They have little faith in such a means of increasing the number of students, and rightly so. The purpose of public lectures may be, however, not so much to create desire to study as to enlighten the community upon the relation of science to individual and national life. The point of view is thus entirely different from that of the local educational institution or the local scientific society, both of which regard popular lectures as possible means of securing new students or members. The position is clearly stated by Principal Garnett, School of Technology, Manchester, in the following reply:

A more general realization by competent lecturers of the benefits which popular lectures may confer upon the community and a greater readiness on the part of universities and colleges to spend money on the provision and advertisement of such lectures. At the present time eminent men of science are, with few (if any) exceptions, rendering in other ways more valuable national service than they could render by the delivery of popular lectures. Moreover, the restricted financial resources of governing bodies are probably more usefully employed in the conduct of research and in providing the education required by men who are to occupy responsible positions in the various industries. The financial difficulty would disappear if an inspiring account of the broad outlines of natural science formed part of the curriculum of every elementary and secondary school. This "science for all" is to be carefully distinguished from the science training given to those who are to pursue further the study of science in some institution of higher education or are to use it in their daily work.

Mr. R. J. Moss (Royal Dublin Society) says:

Much more attention must be given to science in school education. It should be made interesting and taught as much as possible by demonstration and experiment. In this way the coming generation may be enabled to appreciate science and to take an interest in the progress of knowledge. A great deal of good might be done by the creation of traveling lectureships to be held for a limited time by men who show an aptitude for the work.

12. *What do you consider are the chief elements of success, or reasons for failure, of public lectures upon scientific subjects?*

Among the conditions of success mentioned in replies to this question are: (1) The reputation and personality of the lecturer, (2) effective advertisement and newspaper reports, (3) energy and efficiency of local secretaries and committees, (4) attractive titles, and choice of topical or popular subjects, (5) plenty of lantern slides, use of bioscope films, or good experimental illustrations. It is obvious that a lecturer should adapt himself to his audience, and should possess expository power, so as to deal with his subject in a clear and interesting manner, without degenerating into the style of a public entertainer.

Professor Herdman states the chief ele-

ment of success to be "a good lecturer who can be heard, has a definite story to tell, and can tell it in plain language." This is also the view of Principal Garnett, who says: "The chief elements of success seem to me to be that the lecturer should be vividly conscious of the closest relation that exists, or that can be established, between his subject and the daily lives of his audience; and that he should possess an expert knowledge of his subject, a power of lucid exposition, and a pleasant and forcible delivery."

The replies received show that these conditions are rare among lecturers; and failure is often ascribed to the absence of them. A subject and style appropriate to a lecture at the Royal Institution are unsuitable for a working-class audience such as that at the Royal Victoria Hall, though this is sometimes forgotten. The librarian and director of the Sunderland Public Libraries, Museum, and Art Gallery, remarks:

The expertness of the lecturer and his constant association with experts often causes him to be ignorant of the ignorance of his audience. On the other hand, he is occasionally patronizing. In failing to approach his subject from their point of view he is occasionally "over their heads," and, despite his specialization, frequently fails where "a man of the people," or a non-expert, will succeed with less knowledge, but better judgment. There should be the same difference between a "popular lecture" and a scientific discourse, as between an interesting primer and an advanced scientific treatise in literature. The successful "popular" lecturer is, I think, more rare than the advanced or scientific lecturer. Failure may possibly be attributed to the growth of light-entertainment halls, or maybe to a wider and more popular treatment of subjects in the press. There is also a greater literature now, and a wider circulation of it through libraries.

Even in lectures to local scientific societies the subjects are frequently treated in too advanced a manner, and are therefore unintelligible to many of the audience. It is suggested by some correspondents that if more attention were given to science in schools there would be a larger attendance at popular lectures; but much depends upon the nature of the science teaching. The principal of the technical school, Barrow-in-Furness, writes:

I am afraid that one of the causes lies in the dreary nature of the instruction in "science" given in the day-schools (secondary). No one here who has learned chemistry, for instance, in a day-school seems to wish to learn more.

The thirst for amusement and excitement, no doubt, accounts largely for want of interest in science by the great majority of the public. There are now so many counter-attractions, such as picture palaces, music-halls, and other places of entertainment, that the general public is attracted to them rather than to lectures which require mental effort to understand them.

People want recreation after the day's work, and prefer amusement rather than instruction.

Experience shows that in an ordinary provincial town there is usually a small minority of intelligent persons who profit considerably from popular or semi-popular science lectures, but that the general community of the district is untouched by them.

Such attempts as have been made to reach larger audiences, with a low standard of education, by means of ultrapopular lectures have proved failures (Gloucester).

In this, as in most cases, lectures of the instructive type are referred to, and not those which aim at the appreciation of science as a living force in social economics or state affairs. Mr. H. J. Lowe, secretary of the Torquay Natural History Society, remarks:

The only way I can see to helping science into its proper position as an essential in national development is by the recognition and proclamation by the government and educational authorities of its immeasurable importance in attaining national efficiency. This should be followed by some general scientific knowledge being required in all pass-

ing examinations, as a guarantee of an acquaintance with science method and reasoning.

The provision now made for the study of scientific and technical subjects accounts, no doubt, for the failure of popular lectures in many districts. When there were few institutions of higher education, the thoughtful section of the population took advantage of such lectures to extend their knowledge, but now the same class is provided for in educational institutions and courses. The public science lectures of the present times, therefore, need not be of the same kind, or on the same subjects, as those of a past generation, but should be adapted to more modern needs and interests. Above all, they should be intended for the people as a whole, and not for students or others who propose to devote systematic attention to the subjects of the lectures or devote their careers to them. This distinction is not recognized in the subjoined remarks by Mr. C. F. Procter (Hon. Sec., Hull Scientific and Field Naturalists' Club), which represent the views of many scientific societies as to the present position, yet it is most important.

Mr. Procter says:

Scientific lectures can only be made popular in the sense that you attract the crowd of unscientific people, with a profusion of experiments, or, failing that, lantern illustrations. People will flock to the Egyptian Hall and are vastly entertained and educated a little by an exhibition of what is often clever scientific acrobatics. Human nature loves to see what it can not understand, and twenty years ago represents a period when the commonplaces of science were a wonderland to the average mind. The trend of education has altered that, and has sharply divided the same people into a minority of scientific enthusiasts who "ask for more," and a majority of indifferents who remain cold at a display of the old elementary stuff. Education (and that includes very largely the popular science lectures of the past) has created in this, as in all the arts, a small aristocracy of intellect, or, rather, comparatively small. These are not satisfied with anything that can possibly be popular. They are long past that, but will feverishly attend anything which proposes further to explore the deep water. The crowd—the man in the street and his womenkind—has had its wonder-bump excised in the school laboratory. Modern sensationalism in amusement and the plethora of scrappy yet crisp literature (which religiously exploits every new thing, scientific or otherwise, that may entertain) has calloused this excision. The application of the film-pictures to microscopy, etc., is about the only way to popularize science lectures, but—why bother? We can not all be men of science, and the present system provides that any who get the call may answer it, whilst popular lectures only attempt to entertain individuals of an age who are already past the slightest hope of ever being useful scientists. The proper thing is already being done by our schools, universities and university extension lecturers with our budding professors.

The following letter from the acting registrar of University College, Nottingham, bears upon some of the foregoing points:

Popular lectures have been delivered for the past thirty-five years at this college. During the past few years the numbers delivered on science subjects have been less than in previous years, but there is good reason to believe that if some pecuniary assistance from a central fund could be devoted to lectures on science much progress might be made, not only in this city but throughout the whole of the East Midland area. At one time it was the practise to arrange during each session two or three series of lectures on scientific subjects during the winter terms. These series consisted of three or four weekly lectures on each subject and were generally delivered by professors of the college. The professors received no extra remuneration for this work and as the ordinary college work grew it was almost impossible for the time to be spent in the preparation, which, it can be well understood, was very extensive. Ten to fifteen years back we always had crowded audiences, but these were cut down owing to the opening of so many picture-houses in the city and also to the fact that many of the senior scholars from the secondary and other schools now continue their education at the college and other institutions, attending two and three evenings per week.

CONSTRUCTIVE PROPOSALS

Many correspondents are of the opinion that the formation of a panel of lecturers

who would be prepared to assist small societies by lecturing for a small fee would be of great assistance. Mr. H. V. Thompson, Hon. Sec. of the North Staffordshire Field Club, says:

It would greatly facilitate matters if the British Association prepared a list of lecturers on various scientific subjects who, although not necessarily in the first rank of scientific attainment, could be relied upon to give lectures which would hold and interest a normal popular audience. This course would much assist local clubs and societies in the difficult choice of lecturers and also enable them to gauge the interest in science in the district. Furthermore, promising young men would be introduced to districts where they are unknown at the present time.

Mr. H. E. Forrest, Hon. Sec. of the Caradoc and Severn Valley Field Club, makes much the same suggestion, as follows:

I think local societies might help each other a great deal more than they do. In almost every society there are one or two members who are good lecturers on some particular branch of natural science. These might, in many instances, be willing to lecture to other societies for their expenses or a nominal fee. I suggest that you prepare a list of these gentlemen (giving addresses), with the subjects on which they lecture, and send the list to all corresponding societies, leaving it to their secretaries to make arrangements direct with the respective lecturers.

Mr. Herbert Bolton, curator of the Bristol Museum and Art Gallery, suggests that there should be an exchange system of lecturers among museum curators:

If, say, a dozen curators had all to work up lectures upon subjects with which they are familiar, they could, by arrangement, deliver the lectures at eleven other places in addition to their own, and so put in a good winter's work and make a good lecture reach a wide audience.

Similar suggestions are made by several correspondents for the exchange of lecturers among local scientific societies.

SUMMARY

1. Many local societies arrange for the delivery of occasional popular or semi-popular science lectures, but the audiences are mostly made up of members and their friends.

2. In most places there is a small circle of people interested in scientific work and development, and sufficient means exist to enable them to extend their acquaintance with diverse branches of natural knowledge, but the great bulk of the community is outside this circle and is untouched by its influence.

3. Popular lectures on scientific subjects do not usually attract such large audiences as formerly in most parts of the kingdom. To make a wide appeal to the general public the same principles of organization, advertisement and selection of lecturer and subject must be followed, as are adopted by agents of other public performances.

4. Increase in the number of educational institutions has provided for the needs of most persons who wish to study science, either to gain knowledge or prepare for a career. Other people seek entertainment rather than mental effort in their leisure hours, and they require subjects of topical interest, or of social and political importance, to attract them to lectures.

5. Few popular lectures pay their expenses, and scarcely a single local society has a special fund upon which it can draw in order to meet the cost involved in the provision of a first-rate lecturer and adequate advertisement.

6. Expenses of public lectures are usually paid from (*a*) general funds of local societies; (*b*) college or museum funds; (*c*) rates; (*d*) education grants; or (*e*) Gilchrist and other trusts.

7. After the war there will be a new public for lectures and courses on a wide range of subjects; but one of the main purposes of the lectures should be to show as many people as possible that they are personally concerned as citizens with the posi-

tion of science in the state, in industry and in education.

RECOMMENDATIONS

1. That an annual list of public lecturers on science subjects be prepared and published, with titles of their lectures. No fees should be mentioned in the list, but addresses should be given so that committees organizing lectures may make their own arrangements with lecturers. Local scientific societies, museums and institutions of higher education should be invited to send the names of members of their bodies prepared to deliver lectures to similar bodies elsewhere without fee other than traveling expenses, and the names of such voluntary lecturers should be indicated in the list by a distinguishing mark.

2. That committees organizing public science lectures should include representatives of as many interests as possible, such as municipal corporations, trades councils, cooperative societies, religious bodies, university extension committees, chambers of commerce, educational institutions, local scientific societies and like organizations concerned with the daily work and intellectual life of the district.

3. That to extend interest in science, and belief in its influence, beyond the narrow circle of serious students, increased use of the bioscope in illustrating natural objects, scenes and phenomena is desirable; and an appeal should be made to the interests of all classes of the community by addresses intended to show the relation of science and scientific method to national life and modern development.

4. That to carry on the propaganda of efficiency through science, local committees should endeavor to secure financial support from manufacturers and others affected by national progress, and that local educational authorities be asked to provide funds to enable free popular lectures of a descriptive kind, for children as well as for adults, to be well-advertised and for reasonable fees to be paid for lecturers and their illustrations.

5. That more encouragement should be given at university institutions and training colleges to the art of exposition and public speaking, for the benefit of those students and teachers whose aptitudes may later be usefully exercised in promoting interest in science.

6. That while the training of an adequate number of scientific workers is of prime importance, it is desirable that everyone should be made acquainted with the broad outlines of natural science while at school, and that public appreciation of scientific knowledge as an essential factor of modern progress should afterwards be created and fostered by means of popular lectures.

7. That this report be brought under the notice of each section of the association with the object of obtaining suggestions upon which organized action may be taken in connection with the Gilchrist Trust or independently.

8. That the committee be reappointed as a committee of Section L, its constitution remaining, as at present, representative of all the sections of the association, but with power to add to its numbers.

THE FOURTEENTH NEW ENGLAND INTERCOLLEGIATE GEOLOGICAL EXCURSION

THE annual meeting of the geologists of the New England colleges and universities was held on Friday and Saturday, October 27–28, under the direction of Professors W. O. Crosby and C. H. Warren, of the Massachusetts Institute of Technology.

The purpose of the excursion was to study the batholithic cycle of the Blue Hills at Quincy, Massachusetts. Here the intricate