The British Simuliid Group Bulletin

Number 40

July 2013





THE BRITISH SIMULIID GROUP BULLETIN

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Cover Image: .

Larva of <u>Simulium bracteatum</u> from: Plate III <u>in</u> A. W. Jobbins-Pomeroy (1916) Notes on five North American Buffalo Gnats of the Genus <u>Simulium</u>. <u>Bull. 329</u>, <u>U.S. Dept of Agriculture</u>, 1-48.

From the Editor

This time we have the result of the ballot to decide the venue for the next 6th International Simuliidae Symposium. There were three candidates, Torino, Italy; Pavlodar, Kazakhstan; and Zaragoza, Spain. All three candidates submitted very detailed and well thought out proposals which were circulated to members on 2 July 2013. By the deadline of 21 July, 26 votes had been received, and on the basis of first preference, Torino was selected for the next venue, beating Zaragoza by 2 votes. Congratulations to Simone Ciadamidaro and Bruno Maiolini, and grateful thanks to Erbol Issakaev, Zarina Kairokanova, and Ignazio Ruiz Arrondo for their time and trouble. Details of the ballot are on page 3.

The North American Blackfly Association announce their next meeting for February 22-23, 2014.

Scientific content is provided by a most interesting interview with Dr. Leo Rivosecchi.

Address Lists

While organising the ballot I realised that names and addresses for simuliidilogists were scattered amongst several databases. As a result some members were receiving 2 or even 3 copies of my messages - very annoying. I have therefore taken the liberty of adding all the names and e-mail addresses that I could find to the SIMULIIDAE discussion list which is held at www.JISCMail.ac.uk/SIMULIIDAE. This means that a single e-mail message sent to SIMULIIDAE@JISCMail.ac.uk by anyone on the list will be copied to all the names on the list. Please visit the SIMULIIDAE site to check that your details are correct. You can delete your name if you do not want to be listed. I should also like to know if any names have been omitted, and would welcome any comments you may have about maintaining a central address list.

John Davies

FORTHCOMING MEETINGS

North American Black Fly Association (NABFA) 12th Annual Meeting

Chair: John Walz; Vice Chair: Elmer Gray

Greetings Colleagues,

We would like to take this early opportunity to let you know that the dates for the twelfth annual NABFA meeting have been scheduled for Feb 22-23, 2014. The Georgia Center for Continuing Education on the University of Georgia campus in Athens, Georgia will be the host facility. http://www.georgiacenter.uga.edu/uga-hotel

As always we invite black fly enthusiasts, researchers, control specialists and students to join us to exchange ideas, information and camaraderie. Students are especially encouraged to participate in the Mike Spironello Award competition presented annually to the student giving the best presentation. The award was established to honor the memory of former NABFA Secretary and black fly researcher, Mike Spironello, who passed away unexpectedly in 2006.

Please mark your calendars! And feel free to pass this on to anyone you think might be interested in this gathering. Additional notices will be sent as more details of the meeting become available.

As always, feel free to contact us with any questions or concerns. Thanks!

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6th International Simuliidae Meeting 2014

Result of the Ballot to choose the venue

Three locations tended proposals to hold the 2014 meeting in their city. The proposals and a ballot form were sent to 143 e-mail addresses of persons who had attended the last two symposia, were on the British Simuliid Group list and on the Simuliidae List. The deadline for voting was Saturday 21 July 2013. Voters were asked to indicate their first, second and third choices. In the event of there being a tie for first place, the numbers of second and third choices would be taken into consideration.

The venues were:

Torino, Italy proposed by Simone Ciadamidaro and Bruno Maiolini Pavlodar, Kazakhstan proposed by Isakaev Erbol Maratovich Zaragoza, Spain proposed by Ignazio Ruiz Arrondo

Of the 26 votes received, three offered a first choice only.

Numbers of vot	es cast for 1 st	., 2 nd . and 3 rd choices	at thee three venues

	Venue			
	Torino	Pavlodar	Zaragoza	
First choice	12	4	10	
Second choice	8	4	11	
Third choice	3	15	4	

On the basis of the first choice votes, **Torino** is selected for the 2014 Simuliidae Symposium.

Very many thanks to the three groups for presenting such comprehensive proposals, congratulations to the winners and we hope the loosers will compete again for 2016.

Details of the proposals and ballot can be found at <u>http://www.blackfly.org.uk/symposium2014/symposium2014.htm</u>

Interview

An Interview with Leo Rivosecchi

Reported by Simone Ciadamidaro¹, Bruno Maiolini² & Aleksandra Ignjatovic-Cupina³

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Leo Rivosecchi was born in Grottammare (in the Province of Ascoli Piceno, Marche region, Central Italy) on August 28, 1923, and spent his childhood in Tolentino (Macerata). He moved to Rome while attending the

middle schools and received his secondary school graduation at the "Liceo Visconti" Institute. He was fond of Lepidoptera and Coleoptera and, supported by his family, he started studying insects, graduating in Natural Sciences at the University of Rome "La Sapienza" with a thesis on Diptera Tephritidae, even though the outbreak of the Second World War, in which he was militarily not involved, noticeably delayed the end of his studies. Afterwards, he was employed in the Italian National Institute of Health (ISS), where he worked on parasites and biological control for several years. He carried out 40 years of intensive field sampling and laboratory study on the black fly fauna of Italy. He has written 31 "Contributi alla conoscenza dei Simulidi italiani" (Contributions to the knowledge of the Italian black flies), published in the Italian journal "<u>Rivista di Parassitologia</u>", and together with a considerable number of other works, they constitute the largest source of information on the presence, distribution and ecology of this family of Diptera in Italy.

Dr. Rivosecchi, you are undoubtedly the principal expert of Simuliidae in Italy, and your publications, in particular "Fauna d'Italia, Simuliidae" (1978), represent a benchmark work not only for the study of black flies in Italy, but also in the South European and Mediterranean regions as well. A considerable amount of field and laboratory work must have been necessary to obtain this result. Could you tell us about the beginning of your professional career?

A very important event was the meeting with Giuseppe Saccà, entomologist and young student in medicine, who convinced me to abandon the study of beetles and butterflies and to start working on dipterans.

Actually, I decided to study black flies following a very accidental event. In fact, I was working with some workers of the "Antimalarial committee" for the control of the residual *Anopheles* mosquitoes when, while the team was having breakfast close to a sulfur spring, I was attracted by a dark-coloured stone standing out in sharp relief against the white bed of the spring. The dark colour was caused by a large number of larvae mixed with several small cocoons. Then I put the stone in a plastic bag and put it in my car's boot, but when I arrived to my laboratory in Rome, I found that the bag was full of small flies. I studied them and I realized that I was facing a new species that I described as *Simulium pontinum*, thereafter found in all the sulfur springs of the Southern Latium region.

I was also induced to approach the study of simuliids by Prof. Edoardo Zavattari (zoologist and physician), who underlined the relatively scarce knowledge of these dipterans in Italy during the first congress of the Italian Society of Entomology. In fact, only Emilio Corti had studied them in the Province of Pavia (Lombardy) in order to verify if they could be vectors of Pellagra (the cause of this disease had not been identified yet). However, Corti described a fine, still-valid species, *Simulium bezzii*.

Meanwhile, when I found employment at the National Institute of Health, the Director of the department of Parasitology told me that I had to work on domestic flies (*Musca domestica*), due to the health vocation of our public institute. I followed his recommendations and, studying the genitalia of some African specimens I had received from Prof. Saccà, I described a new taxon, *Musca domestica curviforceps*, which is still considered a valid subspecies. Notwithstanding my care, the first period at the ISS was not so gratifying, since I was considered no more than a good technician, and some colleagues used to call me "the watchmaker".

And what about the prosecution of your work on black flies?

Actually, in the beginning, I was only allowed to work on the black flies from a reclaimed area of the Pontine marshes (Province of Latina, Southern Latium), with the help of a driver of the anti-malaria committee. Following the description of *S. pontinum* (1960), I carried out an ecological study on the concentrations of oxygen and sulfuric acid compatible with the life of this species' larvae in several other sulfur springs. But, when I discovered a new species in the southern area of the Region (*S. liriense*, 1961) I had the idea to perform an ecofaunistic study of the zonation of rivers through the black fly fauna, from the springs to the river mouth. So, I discovered some new species: *Prosimulium albense* (1961) and *S. (N.) fucense* (1962). Thereafter, taken with enthusiasm, my research followed a mainly faunistic course.

I extended my research to the mountains of Central-Southern Apennines, including Sicily. Thanks to this research I was no more considered as a "technician" by my colleagues; rather they recognized me as an autonomous researcher, even though I was also strongly criticized since my studies had limited utility for National health. But two relatively "lucky" events occurred and radically changed the situation: in 1974, a massive attack of black flies on cattle in Trentino and, in 1984, several attacks on humans in Friuli reclaimed the need for a black fly expert. Then my competence was finally necessary! When, in 1982, I was appointed as director of the Unit of Taxonomy and Ecology of vectors, I had to work, together with Simuliidae, on Culicidae, Tabanidae, Trombiculidae, *Phlebotomus*, Ixodidae, etc. But finally in the 1980s, when the environmental impairment of the Roman area had led to the spread of a single species (*S. ornatum*), I turned my interest to Sciomyzidae, parasites of molluscs that were considered possibly useful in the biological control of Schistosomiasis.

So, your beginning with black flies was not that easy. Still, your works demonstrate that you visited a large part of Italy and collected a huge number of samples, and you must have needed resources for it. In terms of money, personnel and equipment...

For the missions during faunistic research, I only had a day allowance and the repayment of the train tickets and car rental. Still, I could consider myself lucky, since my first director, Dr. Mosna, had retired and the new one, Prof. Corradetti, encouraged my research and authorized all my requests for missions. However, my personal expenses were always higher than the Institute's funding, with great complaints from my wife, Ester Taramelli, unfortunately deceased in 1990. So, I worked all alone on the Apennines, with a little help in Sicily from the Hygiene Institute; in Trentino, I was helped by the Zooprophylactic Institute and in Friuli by the Local Health Company (ASL) while Forest rangers never helped me. A great help I received from Giovanni Dell'Uomo, a technician with the ISS. Actually, all the research on the Apennines was supported by a great personal enthusiasm and required big efforts. My research in the Italian North-East was initially of public interest, and then turned to faunistics, too. Afterward, I tried to give the research on Simuliidae a firmer direction through an applicative use of them as ecological indicators for riverwater quality, environment and landscape conservation. Unfortunately, this research, started on the Tordino River (Marche region) and continued in several other rivers with the help of some ISS colleagues (L. Mancini and I. Di Girolamo), had little success with Regional Authorities that should have funded the work.

Concerning the equipment, I made large use of plastic bags for pupae on stones, while I used small tubes for pupae on grasses or other plants. For large rivers, I used plastic strips. In the laboratory, I essentially based species determinations on the morphology of male genitalia and pupal filaments. When I started, I only had two books as guides: Grenier's fauna of France and Rubtzov's fauna of the USSR, the latter written in Russian: I could not understand the text, but the pictures were fascinating.

The authors you mentioned were already eminent scientists at that time. What have been your contacts with other black fly researchers from Italy and abroad? Did you find them important?

I definitely became a fanatic admirer of Rubtzov while studying the species of the "aureum" group (then considered as a single species in

the Western World). But this admiration turned into "desperation" when, in 1962, Rubtzov was invited by Prof. Goidanich of the University of Torino to study the Simuliid fauna of Italy, funded by the Italian CNR (National Research Centre). It was a dreadful humiliation for me and I was close to abandoning the research on black flies. It was thanks to the encouragement of Prof. Sandro Ruffo, Director of the Museum of Natural History of Verona, that I decided to endure, and I am still grateful to him. Then I started to communicate with several researchers. Collaborating with Vera Zivkovic, from Belgrade, was easy thanks to the friendship existing between our Directors (Corradetti and Simic), and we exchanged material and visits. I also exchanged material with Knoz and Raastad. I tried to do the same with Couvert, a great drawer collaborating with Rubtzov, but he remained doubtful and tragically died coming back from a journey in India. I only had epistolary contacts with Crosskey, Zwick, Davies and Fallis, with the latter teaching me to capture adult flies with CO₂ traps. My relation with Carlo Contini initially was configured as concurrence, but then I realized he was an excellent researcher and he had the right to study the fauna of his island (Sardinia); then we became best friends and collaborators. I also want to mention Prof. Bullini and Prof. Cianchi for their scientific and practical help with the problem of "reptans" in Trentino, even if we did not prosecute the collaboration and left the "reptans" group problem unresolved. Other contacts I surely had I cannot remember now, and I apologize for not mentioning them.

Besides all these collaborations, I've never carried out any research activity on black flies beyond Europe, except for some material from Yemen, whose study allowed me to realize the first record of S, damnosum from that country; unfortunately that work had no continuation. Actually, I did not develop any collaborations with other researchers, as I would have liked and as I should have done. This fact was probably a limit for my research, since I remained partly isolated from the rest of the black fly research community. Also for this reason, I appreciated Aleksandra Cupina's attempt to keep me informed by sending me the proceedings of several International Symposia on black flies, since Berlin 2004. In fact, I only attended the first International Congress of Entomology, when I knew Rudolf Rozkosny, who greatly helped me with the study of Sciomyzidae. I also received a great help from the young entomologist Simone Ciadamidaro and Bruno Maiolini, who I consider the future of black fly research in Italy. They helped me deal with the problem of updating the Italian black fly fauna, one of the principal themes of my research, together with the study of massive attacks on humans and the attempts to use black flies as indicators of a perfect environmental conservation.

Taxonomic problems have always been extremely relevant in the work of all Simuliidae researchers. Nomenclatural changes and new methods in systematic analysis cause frequent changes in the taxonomy of the family, in particular after scientists have started to use cytological and molecular techniques together with morphology. What is your opinion on the results obtained using the different approaches?

During my research, I have principally used morphology as a basis for every taxonomical study, but, as often as I could, I consented with the requests of some chromosome researchers to analyse my larval material, previously preserved in Carnoy's liquid. Canadian scientists asked me for samples of Eusimulium latizonum form "paludicula" and S. (Hellichiella) saccai: they demonstrated the first to be a synonym of S. (E.) angustipes, while the second is not a synonym of S. (H.) latipes. I also collaborated with Prof. Bullini of the University of Rome "La Sapienza", who used allozymes to demonstrate the distinction between S. reptans and S. voilense and the identity between S. voilense (10 filament form) and the Italian populations of S. colombaschense (12-14 filament forms), even if these results still need confirmation from It is evident in this case that the simple molecular studies. morphological examination, although accurate, is not sufficient to resolve some situations. However, I think it is important not to exaggerate the results of new methodologies of taxonomical analysis, in order to avoid what Mr. Grenier called the "polverizasion des especes".

In your written works, there are very detailed and precise morphological descriptions regarding several features and followed by extraordinary pictures. Has drawing always been one of your passions?

I like drawing very much, but finally I became aware of the fact that a scientific designer must be able to give himself some limits. I mean that the drawing should be as schematic as possible, omitting all the details that are not useful for the identification. A too detailed drawing confuses the ideas. In this way, drawing is important since the drawing represents what a researcher really understood of the feature he was facing, and sometimes what he didn't. Notwithstanding this fact, in some cases (for example, shading through punctuation) it is necessary to appeal to a professional designer, as I did for the mesonotum of black flies (made by Ms Giuliana Micozzi). On the contrary, I made all Sciomyzidae drawings by myself.

In the last century, there were two main schools dealing with the taxonomy of black flies: the Russian one, established by Rubtzov and followed by Yankovsky, that often raised subgeneric names to generic

level, and the British one, established by Edwards, Davies and Crosskey and that has been almost universally adopted by the scientific community since the 1980s (as demonstrated by Crosskey and Adler's inventories). What is your opinion and what are the advantages for the two options?

When I had some uncertainties on the taxonomical level of a new taxon, which occurred often during my studies, I considered it more logical to address to it as a subspecies. But, adopting Crosskey's nomenclature, I would have been forced to indicate as many as 4 Latin names for a taxon based on a small morphological detail. So I preferred Rubtzov's nomenclature, which, without subgenera, allowed me to use no more than 3 names, even with subspecies. I thought this was the best solution for my situation. Considering that nowadays the subgeneric nomenclature is universally adopted, I have to repent bitterly for my choice. On this issue, somebody wrote: "One of the worst abuses by taxonomists is the institution of a new subspecies every time they have a doubt on the species validity of a taxon". If this is true, I am one of those who definitely had this terrible custom. I also tried to repair this, writing a new key and atlas of Italian species together with Maiolini, adopting subgeneric nomenclature.

Continuing on the issue of the new taxa, there are a good number of taxa described by Leo Rivosecchi in Adler & Crosskey's inventories (2012), and most of them are still valid names...

Apart from the taxa described as "forms" (*sulfuricola*, *fluminicola*, *curvifila*) or as subspecies (*italicum*, *parvifrons*, *paramorsitans*), only one species has fallen in synonymy: *S*. (*Wilhelmia*) *sangrense*, imprudently described on the basis of a single specimen never collected again.

Some species, such as <u>P. calabrum</u>, <u>Metacnephia sardoa</u>, <u>S. saccai</u>, <u>S. dolomitense</u>, <u>S. fucense</u>, <u>S. ichnusae</u>, <u>S. marsicanum</u>, <u>S. pontinum</u>, <u>S. sicanum</u> and <u>S. continii</u>, were found only in Italy or on the Italian isles. How do you explain such a large number of endemics, also from an ecological point of view?

I've been wondering about this issue for a long time, and I believe I found an answer in two articles published in the volumes of the Italian society of biogeography: B. Baccetti's "Biogeografia Sarda venti anni dopo" (Lav. Soc. It. Biogeografia, 8:859-870; 1980) and S. Minelli's "Riflessioni sull'endemismo e la vicarianza nel regno animale" (L. So. I. Bio., 4:77-98; 1973).

About Sardinia: excluding the two species of the genus *Urosimulium* (I've surely recognized a nymph of *U. jucii* in a sample collected in Spain) and *S. continii* (described only from larval stages), the

remaining endemic taxa are three species whose biogeographic significance could be explained on the basis of Baccetti's hypothesis of all Sardinian entomofauna. In fact, *M. nuragica* is the result of an ancient colonization (pre-Miocene) by cold fauna: it is a vicariant species and close to *M. tredecimata* from Scandinavia. *M. sardoa*, on the other hand, descended from a Miocene colonization by warm fauna, being close to *M. blanci* of North Africa. Finally, *S. (N.) ichnusae* comes from a recent (Quaternary) colonization by cold fauna, being close to *S. (N.) carthusiense*.

In Sicily there is only one endemic, *S. sicanum*, a cold-water species vicariant of *S. monticola*.

In the Peninsula, even if a strong penetration of the Central European fauna along the Apennine Mountains is known, not all the species reach Sicily, and in the South of the Peninsula S. argenteostriatum and P. latimucro are substituted by S. hispaniola and P. albense, respectively, two non-endemic vicariants. Concerning the true endemic vicariance phenomenon, Minelli distinguished two possible forms: "geographical" and "ecological" vicariants. There are three geographic endemics in the Apennines: S. (N.) fucense, a spring slow-water species, instead of S. (N.) costatum; S. liriense, a deep river species, instead of S. colombaschense; and S. (H.) saccai instead of S. (H.) latipes. Regarding ecological vicariants, S. pontinum replaces S. ornatum in sulfur springs, P. calabrum is found in Calabria's forests instead of P. rufipes and S. (N.) marsicanum is generally a vicariant of S. (N.) vernum in forest-covered brooks. However, I find it singular that such a diffuse and characteristic species in the Apennines, S. marsicanum, has not been found in surrounding Mediterranean countries up to now.

The conservation of the habitats for such a large diversity of species is undoubtedly very important, but the last reports of most of these species are quite dated. Do you think we could still find these species in the same areas or are they in danger of the strong changes occurring in rivers all over Europe?

I can answer with some examples: the type site of *S. pontinum*, that is, the sulfur spring "Acquapuzza" in South Latium, still exists, as recently confirmed by Simone Ciadamidaro, but the stream is reduced to a channel and there is strong water capture, with great risk for the conservation of the population. The protection of sulfur springs is important for the large biodiversity associated with their high nutrient load, but it is very difficult to obtain the interest of local administrators in defense of species with such a low appeal for most people. The type site of *S. fucense*, the springs in Fucino plain, Central Italy, still exist, but the populations I knew in Abruzzo disappeared following the cut of the populations may survive in Umbria, where trees were not cut. The worst situation is with regard to *S. liriense*, which seems to have

completely disappeared downstream of the confluence of the Liri river with the Sacco river (Latium). This is not surprising, especially when considering that, some years ago, several birds and sheep that drank from the river died from poisoning. The only hope for this species is that it survived in some river reaches upstream of the confluence with the Sacco river.

Do you want to add some additional information about your activities?

Well, I cannot deny that after the publication of the black flies "Fauna d'Italia" volume, the number of works and publications I produced on these dipterans strongly diminished; therefore, I feel like I have to explain the reasons. The principal reason, as I said before, was my appointment as the director of Unity of "Taxonomy and ecology of vectors". In fact, in order to avoid passing all my time studying my collection, which I kept in the laboratory, I decided to send it to the Museum of Natural Sciences of Verona. The second factor was the invitation I received from Prof. Ruffo to write a book on aquatic dipterans, which occupied most of my time. When I retired at 64 years, I remained without funds for my field research. Finally, my driving license was revoked for age limit.

On the basis of your wide experience with black flies and their importance in ecology, could you suggest an aspect that you consider an interesting issue for future research on black flies?

I think that population dynamics should be studied further in depth; I find extraordinary the fact that sudden increases of a black fly population can be suddenly followed by a complete disappearance of these insects in the following years. The factors leading to this clamorous change lie not only with the quality of river waters, but also with the conditions of the entire landscape, where, it should not be forgotten, half of the black fly life cycle takes place. I am increasingly convinced that no other insect group can represent, as black flies do, the perfect conservation indicators for natural environments.

ACKNOWLEDGEMENTS

With deep respect, the authors of this interview would like to express their gratitude to Professor Leo Rivosecchi, former researcher at the Italian National Institute of Health, Rome, Italy, for sharing his rich life-experience and wise personal points of view on back fly research and on his scientific achievements. The authors are also grateful to Professor Peter Adler, Clemson University, South Carolina, for sharing his ideas, providing useful suggestions to design the interview, and reviewing the final version of the text.

THE BRITISH SIMULIID GROUP

The British Simuliid Group (BSG) is an informal assemblage of scientists of any discipline, from many countries, who have an interest in the Simuliidae. The group's members include entomologists, parasitologists, environmentalists, ecologists and medics, with interests in ecology, bionomics, taxonomy, cytotaxonomy, disease transmission, freshwater biology etc. Our aim is to assemble as diverse a group as possible in order to encourage a wide interchange of ideas and information.

At present the BSG has about 130 recorded members in the UK, Europe, Africa, Australia, New Zealand and the Americas. Membership is FREE - there are no restrictions. If you are not already a member of the BSG and you wish your interest to be known, all you have to do is send your name and postal and e-mail addresses to the editor at *jaybeedee@gmail.com*. Annual meetings have been held at different locations in the UK since 1978. Abstracts of papers presented are published in our *Bulletin* which is now available for downloading from the internet.

The Group also runs an electronic news list with the name "Simuliidae" which is now on JISCmail. To join "Simuliidae" send the following command as one line of text in an e-mail message without subject heading- join Simuliidae your-firstname lastname to: jiscmail@jiscmail.ac.uk. The Simuliidae list owner is the Editor of the Bulletin. Current and back numbers of the *Bulletin* can be viewed on the World Wide Web at URL:

http://www.blackfly.org.uk.

Inquiries about the Group and its activities should be made to John Davies: address on the back cover and e-mail: jaybeedee@gmail.com

Notes for Contributors

To avoid copy-typing, the editor (address above) would prefer to receive contributions on disc or by e-mail, or typewritten. Details as follows:-

1. Via conventional mail on CDRom or IBM PC formatted 720Kb or 1.4Mb 3.5 inch diskettes, as unmodified word processor files (most common DOS or Windows word processor formats are acceptable) or as RTF, PDF, ASCII or DOS text files (We usually have to change pagination and heading format, anyway). Mark the disc with the format, word processor name and file name(s). Complicated tables and figures can be accepted as separate graphics files (not OLE embedded, please!) but we may ask for a hard copy as a check that all detail has been retained. Remember that figures should have legends and small detail drawn large enough to be visible when reduced to 100mm by 70mm. Diskettes will be returned on request.

2. <u>By electronic mail via the Internet</u>. Send your file in MSWord .DOC or .DOCX or in .RTF or .PDF format or as an ASCII file (also known as DOS or txt File), and e-mail it either as part of the message or preferably as an attachment to: jaybeedee@gmail.com

If neither of the above methods are available, then post to me printed copy on A4 paper (210x297 mm), single spaced, ready for scanning. Heading styles as in the Bulletin. Format for References is flexible. Please refer to the Bulletin for the form appropriate to your article. Scientific Communications should quote the full title and journal name, but Notes and Abstracts may optionally omit titles and show only the abbreviated journal name.

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Content covers papers presented at the Group's Annual Meeting, which is usually held in September, short research notes, notices and accounts of meetings, and articles of anecdotal or general interest that would not normally be found in international journals. Geographical cover is world-wide, and is not restricted to the British Isles. Reports of research carried out by graduates, young scientists and newcomers to the subject are particularly encouraged. It is an ideal medium for offering new ideas and stimulating discussion because of the very short interval between acceptance and publication.

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