SIR RICHARD FANSHAWE.

ppy; for whether in the arduous task
ice or in the quiet happiness of home,

in literature, poetry, was from first to
of his life.

SUGGESTIONS FOR IMPROVING THE
LITERARY STYLE OF SCIENTIFIC
MEMOIRS.

BY FRANCIS GALTON, D.C.L., HON. SC.D.CAMBRIDGE, F.R.S.
[Read April 29th, 1908.]

The memoirs published by scientific societies are
blamed with justice for being more difficult of com-
prehension than need be, owing to a want of sim-
ple licity in their language, of clearness of expres-
sion, and of logical arrangement. Forcible remarks in
this sense were publicly made, by more than one
person, at and about the time of the last Anniversary
Meeting of the Royal Society. This opinion had
also been held by myself for many past years, during
which I have chafed at the impediment caused by
rugged and careless writing to my honest endeavour
to keep abreast with the advances of modern science.
Success in this, under the most favourable conditions,
and in only one branch of science, would occupy the
spare energies of most men. It is a cruel addition
to their labours that the information they need
should be contained in crabbedly written memoirs.

It has been my lot to serve on the councils of
many scientific societies, and to have had more
MSS "referred" to me than I could now enumerate.
My experience is that an undue proportion of
them had to be read more than once, and to be
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puzzled over in parts, before it was possible to justly comprehend what their authors had in their minds to say.

It must not be imagined for a moment that I pose as a literary critic. I am far too sensible of my own grave deficiencies to assume that position. But a man need not be a cobbler in order to know when his shoe pinches. My standpoint is merely that I find many scientific memoirs difficult to understand, owing to the bad style in which they are written, and that I am conscious of a rare relief when one of an opposite quality comes to my hand.

Having become a Fellow of the Royal Society of Literature through the invitation of the Council, I seize the opportunity of asking its powerful help in considering methods by which this grave defect may be lessened. To this end, I will proffer some suggestions of my own, which I hope will be well discussed, and may induce others to assist in this crusade. If useful conclusions should be reached, it would be open to Fellows of scientific societies to press for reforms, under the consciousness that the proposed methods for obtaining them had been carefully considered, and were not simply the crude offspring of their individual brains. I ask for nothing that lies outside of the purview of the Royal Society of Literature. It is not proposed by me that the Society in its corporate capacity should thrust advice upon the scientific societies, who might resent interference, but merely that it should discuss certain general principles, leaving action upon them to other hands, in the way just described.

I now proceed to speak of some of the literary defects, other than bad grammar and style, that make scientific memoirs difficult to read. One of the most prominent is a surplus of technical expressions that have not been naturalised among scientific men. It is important to avoid the use of technical words, but they should be minimised. It is especially necessary so in the opening paragraphs of a memoir, for the function is to explain the object of the paper in the plainest possible language. If it be necessary to use unfamiliar technical words, their meaning should be defined in a foot-note. The paragraphs of a memoir should be intelligible to any man who is conversant not only with the science to which it belongs, but to a limited extent also. A similar remark applies to the conclusions of paragraphs, in which the author summarises the results. The intending reader will judge for himself whether or not the conclusions are arrived at by the author, and doubtless to others, to have been arrived at by the author himself in the way just described.

Some people object before a Society to the use of "imprimatur" to newly coined words. I think that they fail to express their meaning, and are unnecessarily cumbersome. The way to avoid this might be applied will be explained when I come to discuss the terminations of the two Mendelian
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also. A similar remark applies to the concluding
paragraphs, in which the author summarises his
results. The intending reader will then be able to
judge for himself whether or no the memoir falls
within his own province and merits his further study.
Owing to a want of care in writing the opening
paragraphs, it has not infrequently occurred to my-
self, and doubtless to others, to have been perplexed
about the exact purpose of a paper until it has been
half read through.

Some veto is desirable before a Society gives its
“imprimatur” to newly coined words, for many of
them fail to express their meaning, and very many
are unnecessarily cumbrous. The way in which the
veto might be applied will be explained later on, I
now am merely calling attention to its need. To take
one example of bad nomenclature, the contrasted
terminations of the two Mendelian words “domi-
"nant" and "recessive" imply a distinction which does not exist. Recedent would have been unobjectionable on that ground.

The nomenclature of modern chemistry seems preposterous to outsiders, even after making liberal allowance for inherent difficulties. I copy one of these chemical words from a paper now lying on my table, it is "Dimethylbutanetricarboxylate," and is not the longest that might have been adduced. But it suffices for an example. It is of course understood that these are what have been termed "portmanteau" words, in which a great deal of meaning is packed, but they are overlarge even for portmanteaux; they might more justly be likened to Saratoga trunks, or to furniture vans. It is with the greatest diffidence that I suggest that a single letter might sometimes suffice to show what is now delegated to one or two syllables; if so, the word would be shortened in proportion. In certain barbarian languages this is a familiar process.

Long English words and circuitous expressions are a nuisance to readers, and convey the idea that the writer had not that firm grasp of his subject which every one ought to have before he takes up his pen. Clear views are naturally expressed in brief and incisive language. The power of the English tongue when limited to the use of words of one or two syllables is remarkably great. Excellent instances of this are to be found in the writings of Tennyson. I will quote some marvellously graphic descriptions from his Palace of Art, which refer to certain well-known pictures, and are written under the above limitations.

"One showed an iron coast and angry wave;
You seemed to hear them rise and fall,
And roar rock-thwarted in their bellow.

Beneath the windy wall,

And one, a full-fed river winding slow
By herds upon an endless plain,

The ragged rims of thunder brooding;
And shadow streaks of rain."

There are about twenty gems like this in his Palace of Art.
The to-and-fro arguments in the Treatise are equally concentrated and forcible.

"The memory of the withered leaf
In endless time is scarce more still
Than of the garnered autumn slain
Go vexed spirit, sleep in trust;
The right ear that is filled with sound
Hears little of the false or just."

Or again—

"Yes, said the voice, thy dream was true;
While thou abdest in the bud,
It was the stirring of the blood.
If Nature put not forth her power
About the opening of the flower,
Who is it that could live an hour?
Then comes the check, the change!
Pain rises up, old pleasures fall,
There is one remedy for all."

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“Yea, said the voice, thy dream was good,
While thou abdest in the bud,
It was the stirring of the blood.
If Nature put not forth her power,
About the opening of the flower,
Who is it that could live an hour?
Then comes the check, the change, the fall,
Pain rises up, old pleasures pall,
There is one remedy for all.”

The comparative rarity among the English of a
keen sense of the difference between good and bad
literary style is a great obstacle to the reform I
desire. It is especially noticeable among the
younger scientific men, whose education has been
over-specialised and little concerned with the "Humanities." The literary sense is far more developed in France, where a slovenly paper ranks with a disorderly dress, as a sign of low breeding.

I have had occasion to read many memoirs in manuscript, on subjects where I was fairly at home, in which there was nothing especially recondite, but the expressions used in them were so obscure, the grammar so bad, and the arrangement so faulty, that they were scarcely intelligible on a first reading; nevertheless the writers could hardly be made to perceive their shortcomings. I have heard equally bad reports relating to essays sent by candidates for Fellowships at Colleges in one at least of our Universities. The writers of them may have been, and probably were, successful investigators, but their powers of literary exposition were of a sadly low order; so low that they could hardly be made to realise their deficiencies. The preliminary culture of students in science, seems usually to have been very imperfect.

Sufficient has now been said as to the need of reform and of the difficulties to be overcome in affecting it. It becomes our next duty to consider the steps that should be taken towards that end. The power of reform lies largely in the hands of the councils of the scientific societies, who can withhold the publication of memoirs presented to them, or accept the memoirs under such limitations as they please. A Society gives much, consequently the Council who represents it has a right to exact much in return. The Society supplies a stage from which a writer can disseminate his views, and have them subjected to the criticism of experts, to the cost of publication of the memoir occasional circumstances, that of expensive plates. Therefore the Society, on its behalf, may fairly demand that (1) the memoir that is submitted to them should be written in a style that is creditable to the journals; that they should be lucid, clear, and easy for its members (who pay for them) to understand as the nature of the subject demands. I suggest that Councils should require the literary sufficiency of every paper before discussing whether it should be published. It is hardly necessary to mention that it is the universal custom of Councils of Scientific Societies to "require" a manuscript that is submitted to them. If more referees are selected among the Fellows who are able to give a trustworthy opinion on the merits of the paper. The referees are supplied with a schedule on which numerals and questions are printed, which they answer confidentially. Their report is sent to the Council, which then proceeds to question whether or not the memoir should be published as it stands, or subject to some modification or be rejected altogether. What I now wish to point out is that the printed reference paper shows questions as to the literary suitability of the memoir. They might be such as—"Do you consider the memoir to be (1) clearly expressed, (2) avoiding superfluous technical words, (3) orderly in arrangement, (4) of appropriate length. (5) Should any new terms be used in the memoir?"
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what they are and whether you consider them appropriate. (6) Add such general remarks on its literary style as you think would be useful to the Council when considering its publication.”

I do not presume to anticipate what action a Council might take if the answers to these questions were more or less unfavourable, as much would depend on other considerations. What I want is that the members of the Council should not be left in the dark, as they usually now are, on one important element of goodness or badness in the memoir, before they consider the question of its publication. Also that they should appreciate the widely felt desire for literary reform.

There is yet another way in which scientific societies might be made to realise the occurrence of literary faults in the memoirs that they publish, namely, by occasional articles containing a selection of passages that are conspicuous for shortcomings.

I now crave your opinions on these suggestions, and hope that you will be able to offer other recommendations that may help in accomplishing the very important object in view; namely, that of improving the literary style of future Memoirs published by Scientific Societies.

DISCUSSION.

Sir Edward BRADBROOK.—I have pleasure in the proposal of Mr. Francis Galton. I experience, far less of course than his, scientific MSS, and it fully accords with myself, therefore, with his observations that the Royal Society of Literature should take up. It is within the rightful functions of the note of words that are not yet dictionary words, their proper applications, but to do so would matter. As Mr. Galton says, the chemist addicted to coining long words, The report meeting of the British Association just is portmanteau word of thirty-five letters—methylnaphthalene—and I have; than that. That, however, is not the main use of difficult technical language for the use of the authors of good English; many of them sadly fail Mr. Galton’s suggestion to the addition of the referee paper is excellent. I think it the right thing for the Council to send a call to the various scientific societies, and a suggestion to them for adoption. I agree expressed by a committee of the British Association indeed itself have been put into “that the opportunity furnished by the writing an account of what a student lies in his laboratory work ought to be utilised the teaching of English composition.”

Sir ARCHIBALD GEIKIE.—The complaints temperately urged by Mr. Galton in the past have listened will awaken much sympathy with a general public, but among a large number of the scientific societies, though I think that some might be pressed in their favour. Looking however, as a matter affecting the English literature, I am bound to confess that the contained in the paper are by no means with
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DISCUSSION.

Sir Edward Brabrook.—I have pleasure in supporting
the proposal of Mr. Francis Galton. I have had some
experience, far less of course than his, as a referee of
scientific MSS, and it fully accords with his. I associate
myself, therefore, with his observations as to the rôle the
Royal Society of Literature should take up in this matter.
It is within the rightful functions of the Society to take
note of words that are not yet dictionary words, and see to
their proper applications, but to do so would be a difficult
matter. As Mr. Galton says, the chemists are greatly
addicted to coining long words. The report of the Leicester
meeting of the British Association just issued gives us a
portmanteau word of thirty-five letters—"chloroketodi-
methy1tetrahydrobenzene"—and I have seen some worse
than that. That, however, is not the main point. The
use of difficult technical language cannot be avoided.
What is wanted is to urge the authors of papers to write
good English; many of them sadly fail in this respect.
Mr. Galton's suggestion as to the addition of a question to
the referee paper is excellent. I think it would be quite
the right thing for the Council to send a copy of his paper
to the various scientific societies, and recommend that
suggestion to them for adoption. I agree with the view
expressed by a committee of the British Association, which
might indeed itself have been put into better English,
"that the opportunity furnished by the necessity for
writing an account of what a student has done and seen
in his laboratory work ought to be utilised in relation to
the teaching of English composition."

Sir Archibald Geikie.—The complaints so forcibly and
temperately urged by Mr. Galton in the paper to which we
have listened will awaken much sympathy, not only in
the general public, but among a large number of men of
science. I do not appear here with a brief in defence of
the scientific societies, though I think that some strong pleas
might be pressed in their favour. Looking at the question,
however, as a matter affecting the English language and
literature, I am bound to confess that the strictures con-
tained in the paper are by no means without foundation.
It seems to me that no candid reader can compare the scientific memoirs published at the present day with those which appeared a hundred years ago, without coming to the conclusion that, in average literary quality, the modern writings stand decidedly on a lower level than their predecessors, and that the deterioration in this respect is on the increase. The earlier papers were for the most part conceived in a broader spirit, arranged more logically, and expressed in a better style than those of to-day. They show their authors to have been generally men of culture, who would have shrunk with horror from the slipshod language which is now so prevalent.

If it be asked what reason can be assigned for this change, various causes may be suggested. In former days, when life was less strenuous than it has now become, the number of men of science was comparatively small, and they belonged in no small measure to the leisureed classes of the community. They were not constantly haunted by the fear of losing their claims to priority of discovery, if they did not at once publish what they had discovered. They were content to wait, sometimes for years, before committing their papers to the press. And no doubt the printing of their papers was likewise a leisurely process, during which ample opportunity was afforded for correction and improvement.

But this quiet, old-fashioned procedure has been hustled out of existence by the more impatient habits and requirements of the present day. The struggle for priority is almost as keen as the struggle for existence. As soon as a new observation is believed to have been made, the happy author of it too often dashes off a paper, in more or less legible manuscript, and forwards it without delay to some scientific society or journal for publication. In such hurried contributions attention to literary considerations finds little or no place.

Besides this too common haste in production, another and more serious cause for the defects of which Mr. Galton complains is to be found in the continually augmenting specialisation of science. Advance in every department of inquiry leads into more and more detailed studies. It becomes increasingly difficult, even for men whose lives are devoted to the pursuit of science, to keep in touch with the progress of more than one province of investigation, or even one section of a province. Details thus come to acquire, in the eyes of many earnest and enthusiastic workers, an interest and importance at which they can belong to the broad deductions or which they lead. These authors in theirness for the details which they have painstakingly elaborated, often crowd them in which consequently look sometimes more out of place in note-books or laboratory journals than in presentations of the results of research. It can be found that, as a rule, such excessive detail is of the several steps in an inquiry is from the scientific point of view, as it is from the literary side.

Closely connected with this specialisation of detail is the increase in the number of terms with which the papers in every department bristle. The multiplication of these terms and the necessity of their classification has led to a special terminology. The importance of the terms as a result of the investigation of phenomena. They are, for the most part, the product of an extensive and precise language. The plea that the vernacular tongue, as possible, be employed for this purpose is based on the objection that the language of science is not possible, to be cosmopolitan, and that those who are cut off from learning and from those who can be most easily adapted for the literatures of other countries. Hence the preference for the language of Greek and Latin. The purity of the English language and the diglossia which it is not unnatural for the flood of novel words to come into is at a rate with which industrious lexicographers cannot keep up. The flood is inevitable, and must increase in volume, gathering strength to be stemmed by an authority that, perhaps, may be reasonably insisted upon. The new term shall be absolutely necessary, that it shall be a new one, and that it shall conform to the language of the tongue, whether living or dead, from which it is borrowed.

Many men of science share Mr. Galton's view that, as the language of science is becoming more and more difficult, it is for the individual to follow with full intelligence and sympathy
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details of the several steps in an inquiry is as unnecessary
from the scientific point of view, as it is repellant from the
literary side.

Closely connected with this specialisation and augmenta-
tion of detail is the increase in the number of new technical
terms with which the papers in every department of science
now bristle. The multiplication of such terms is ad-
mittedly a necessary accompaniment of the development
of scientific research. It is obvious that each new fact
brought to light in the investigation of nature should be
precisely defined by some word or phrase having a definite,
unambiguous signification, and preferably capable of being
adopted with but slight modification into any modern lan-
guage. The plea that the vernacular tongue should, where
possible, be employed for this purpose is met with the
objection that the language of science ought, as far as
possible, to be cosmopolitan, and that those terms are most
suitable which can be most easily adapted into the vocabu-
laries of other countries. Hence the preference for coined
new compounds from Greek and Latin. Lovers of the
purity of the English language and the dignity of English
literature may not unnaturally be grieved to see such a
flood of novel and often, it must be confessed, uncouth
words coming into use at a rate with which the most
industrious lexicographers cannot keep pace. But the
flood is inevitable, and must increase in volume, nor is its
gathering strength to be stemmed by any protest. All
that, perhaps, may be reasonably insisted upon is that each
new term shall be absolutely necessary, shall not be unduly
 cacophonous, and shall not be compounded from more
than one language nor framed in defiance of the grammar
of the tongue, whether living or dead, from which it is
borrowed.

Many men of science share Mr. Galton's regret that it
is becoming more and more difficult or even impossible to
follow with full intelligence and sympathy the advances
made in departments of investigation with which one is not personally in touch. The difficulty is probably inseparable from the rapidity of the increase of knowledge in all domains of nature. But there can be little doubt that it is in no small degree aggravated by the multiplication of technical terms which do not always explain themselves, and for which no explanation is afforded in the papers where they are so rampant. It is becoming every year a more accepted practice that in writing a scientific paper an author has only to consider the fraternity of his own branch of science. If his colleagues understand him, it does not matter whether or not he is comprehended outside their circle. He forgets the interests not only of the general public but also of his fellow-labourers in other fields of research, many of whom would gladly keep themselves informed of the progress of inquiry in departments lying beyond their own special purview, but who are, in too many instances, deterred by the formidable terminological barriers that must first be surmounted. The growing isolation of scientific workers within their own fields of investigation is an evil which may, perhaps, be inevitable, but which, undoubtedly, is much to be deplored. Anything which can be done to lessen it is worthy of the most serious consideration. Since the language of the biologists is becoming increasingly unintelligible to the physicists, and that of the physicists not less so to the biologists, Mr. Galton's suggestion might be usefully adopted, that where necessary or desirable a scientific paper should include a brief summary of its general purport expressed in simple untechnical language. Such a concession to the ignorance of the general reader would probably be welcomed by a large body of scientific men.

It must not be supposed that scientific societies are wholly blind to the evils which have been pointed out in the interesting paper that has been read this afternoon. They are by no means negligent as to the form and style of the papers submitted to them. On the contrary, they have an elaborate system of committees and referees acting under the jurisdiction of the Councils, and no paper is sanctioned for publication without having been subjected to this process of examination. Moreover, the secretaries or assistant secretaries are usually vested with editorial powers, which are exercised as an additional control over the production of the papers. If the original condition of some contributions were compared with the published form, it would be seen how much was bestowed upon their improvement. In more society attention has recently been called to the defective form in which frequently presented. We must hope that other efforts towards amelioration some time.

While in the publications of a scientific excellence will always be subordinated to there is surely no reason why the two qualities be more generally combined than they are. Such a combination will, perhaps, be more easily effected when the writers of scientific papers realise that it will be in their own interest that of their scientific brethren at large, to the outside public, to present such a work as may be intelligible, and even interesting to the ordinary cultivated reader.

Mr. Crackanthorpe, K.C. (who was invited to give the chairman) said the most interesting remark was in regard to the health of the paper just read by Mr. Penber. He had lived that day, and had found him quite cheerful in his room. There was reason to believe that he would very soon be completely his old self, and that the beneficent work to which he had devoted years of his life. (Applause.)

The first point made in Mr. Galton's paper was that scientific memoirs should be "simple in its expression, and logical in its arrangement." These were virtues which every prose composition, whether written or spoken. They should be by the man of science and the layman; by the unlearned; by the learned writer in text and the orator on the platform. Schopenhauer said that the first requisite for the art of writing or speaking was to have something to say; and the second, to think out the subject in hand. Then, "the literary style" would come of itself. To quote a French saying—"The style was the man," it was, or ought to be, an expression of the man at the moment of his writing.

Mr. Galton's next point was that a scientific memoir should not use unfamiliar technical words v
tings for improving the literary art of investigation with which one is in touch. The difficulty is probably due to the rapidity of the increase of knowledge of nature. But there can be little doubt that no small degree is aggravated by the multiplicity of technical terms which do not always exist, and for which no explanation is given in papers where they are so rampant. It is by year a more accepted practice that in scientific paper an author has only to consider of his own branch of science. If his col-stand him, it does not matter whether or not he is a regular outside their circle. He forgets not only the general public but also of himself in other fields of research, many of whom keep themselves informed of the progress of parts of their own special who are, in too many instances, deterred by the terminological barriers that must first be overcome. The growing isolation of scientific workers in fields of investigation an evil which, be inevitable, but which, undoubtedly, is explored. Anything which can be done to remedy the most serious consideration. Since the biologists is becoming increasingly to the physicists and that of the physicists to the biologists, Mr. Galton's suggestion might be, that where necessary or desirable a paper should include a brief summary of its expression in simple untechnical language. The ignorance of the general reader by the large body of scientific acquaintances would not be supposed that scientific societies are aware of the evils which have been pointed out in a paper that has been read this afternoon. It means negligent as to the form and style submitted to them. On the contrary, they have a system of committees and referees acting under the jurisdiction of the Councils, and no paper is published without having been subjected to examination. Moreover, the secretaries are usually vested with editorial power to exercise as an additional control over the papers. If the original condition of some contributions were compared with their ultimate published form, it would be seen how much care has been bestowed upon their improvement. In more than one learned society attention has recently been called from the Presi-dential chair to the defective form in which papers are too frequently presented. We must hope that from these and other efforts towards amelioration some good will follow. While in the publications of a scientific society literary excellence will always be subordinate to scientific merit, there is surely no reason why the two qualities should not be more generally combined than they are here. Such a combination will, perhaps, be most likely to be effected when the writers of scientific papers cease to realize that it will be in their own interest, as well as in that of their scientific brethren at large, and that more of the outside public, to present such a summary of their work as may be intelligible, and even interesting, to any ordinary cultivated reader.

Mr. Crackanthorpe, K.C. (who was invited to speak by the chairman), said the most interesting remark he had to make was in regard to the health of the author of the paper just read by Mr. Pember. He had seen Mr. Galton that day, and had found him quite cheerful, but confined to his room. There was reason to believe that he would very soon be completely his old self, and able to resume the beneficial work to which he had devoted most of the years of his life. (Applause.)

The first point made in Mr. Galton's paper was that a scientific memoir should be "simple in its language, clear in its expression, and logical in its arrangement." These were virtues which every prose composition should possess, whether written or spoken. They should be aimed at alike by the man of science and the layman; by the learned and the unlearned; by the leader-writer in the daily press; and the orator on the platform. Schopenhauer had pointed out that the first requisite for the art of writing was to have something to say; and the second, to have clearly thought out the subject in hand. Then, what was called "literary style" would come of itself. There was an old French saying—"the style was the man." At all events, it was, or ought to be, an expression of the natural mood of the man at the moment of his writing.

Mr. Galton's next point was that a scientific memoir should not use unfamiliar technical words without explain-
ing them in a foot-note, nor more of such words than was absolutely necessary. He (Mr. Crackanthorpe) agreed, although he thought the first of these cautions was rather vague. It might be asked, Unfamiliar to whom? There were, for instance, many technical words which were unfamiliar to him (the speaker), but no doubt quite familiar to Mr. Galton. Where was the line to be drawn? One would hardly expect to find in a scientific work a glossary of terms such as an Englishman looked for in a collection of Burns' Poems. Every scientific writer was surely entitled to assume that his reader had some technical knowledge—otherwise his explanations would be endless. At the same time, if an explanation were given, care should be taken to make it adequate. He would illustrate what he meant by an example. Anyone taking up one of the numerous books on heredity, now appearing in the British and German markets, would come across the word "chromosome." He met the other day with this word in a very valuable treatise just published, "with stainable body," added by way of explanation. Was this adequate? The white tablecloth, now in that room, was a "stainable body" (in the mechanical sense); and so were a hundred other everyday things. If any explanation was wanted, should not the reader have been told, either in a foot-note or an appendix, how colouring matter served to detect the presence of minute particles of matter otherwise invisible even to the microscope-aided eye? Then, the explanation would have been alive.

He might mention by the way, that this same word "chromosome" violated one of the canons laid down in the paper. It was, like the "recessive" of the Mendelians, an instance of "bad nomenclature," because it was wrongly formed. The word should, in strictness, not have been "chromosome," but "chromasome," since the Greek for "colour" was not chromos but chroma.

As to the second of Mr. Galton's cautions, viz. against the use of more technical words than necessary, he would illustrate the point by reference to the "idants" and "ids" of Weismann. It appeared that the nucleated masses into which a dividing cell broke up consisted of several parts. To these Weismann gave the names of "idants"; and since "idants" were theoretically decomposable into particles more minute, he gave to these last the name of "ids." One wondered why he stopped there. He should have gone on to subdivide his "ids" into

"i's, and these again into mere dots, a technical name, thus recalling the old line

"Big fleas have little fleas upon their backs
And these again have lesser fleas, and so on"

(Laughter.)

In this connection he desired enthrall himself with what he understood to fall from Geikie, and to protest against the employment of inexpressible terms to indicate things the use of which was incapable of scientific proof.

Mr. Galton had, at the end of his paper, the shortcomings of the writers of scientific now and then be published as a warning. (Mr. Crackanthorpe) could not help thinking that it would be rather hard measure, even though mentioned. He was quite sure that Mr. Galton was one of the most kind-hearted of men, and would lend himself to any such action. Would he be able to attain if the faulty memoir were retured for revision, and this were, if necessary and again and again until a finished edition was published, when the memoir came to be published? He was not sure that it was presented, there was nothing to offend the most fastidious ear.

Mr. E. H. Pember, K.C.—He sympathised with the motives which had prompted Mr. Galton's paper. But he doubted whether any discussion of the paper could be brought about without much desire. Indeed, what was asked for was a little less than a wide distribution of sound knowledge among the writers of It might be encouraged, but it could not be impossible to establish a discussion on the operations of which might be a though extremely ill-written. The writer and the discouragement, still more the importance of communication, would be too big for the luxury of a fine style. Instead of good composition would be preferable.

It was the desire, he hoped, it was the intention of the Royal Society, putting itself into communication with everyone throughout the kingdom, and possibly t
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STYLE OF SCIENTIFIC MEMOIRS.

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the shortcomings of the writers of scientific memoirs might
now and then be published as a warning to others. He
(Mr. Crackanthorpe) could not help thinking that this
would be rather hard measure, even though no names were
mentioned. He was quite sure that Mr. Galton himself,
who was one of the most kind-hearted of men, would never
lend himself to any such action. Would not his object be
attained if the faulty memoir were returned to its author
for revision, and this were, if necessary, repeated again
and again until a flawless edition was reached? Then,
when the memoir came to be published by the learned
society to which it was presented, there would be nothing
to offend the most fastidious ear.

Mr. E. H. PEMBRE, K.C.—He sympathised fully with the
motives which had prompted Mr. Galton’s very suggestive
paper. But he doubted whether any drastic steps could
be taken to bring about an improvement which everybody
must desire. Indeed, what was asked for amounted to
little less than a wide distribution of something approach-
ing to literary genius among the writers of scientific papers.
This might be encouraged, but it could not be compelled.
It would be impossible to establish a direct literary censor-
ship over productions which might be extremely valuable
though extremely ill-written. The writers would resent it,
and the discouragement, still more the rejection, of im-
portant communications, would be too high a price to pay
even for the luxury of a fine style. Indirect encour-
gement of good composition would be preferable to penalties
upon bad. It was the desire, he hoped he might say that
it was the intention, of the Royal Society of Literature, by
putting itself into communication with educational centres
throughout the kingdom, and possibly by other methods,
to do something substantial in that direction. It was too true that the present standard of prose style was somewhat decadent. When one compared the twentieth with the eighteenth century, the condition of our own epoch left much to be desired. To mention only a very few names, Hume in History, Blackwood in Law, Bishop Berkeley and Sir Thomas Browne in Philosophy, were all living proofs of the truth that profundity in thought and exactness in exposition were not only consistent with, but enhanced by, a clear and elegant style. In the nineteenth century Huxley, Darwin, Mill, and Macaulay were all examples of the same healthy combination. He expressed an opinion that the banishment of the classical languages from general education was one source of the evil, and he trusted that something might be done not only to retain, but to extend, the study of them. Meanwhile, towards the end desired, suspension, and not an aggressive censorship, must be acknowledged to be the working means.

Mr. Percy W. Ames, Secretary.—Mr. Galton has added one more to his many public services by calling attention to the need of improved literary form in the papers in which scientific discoveries are presented to the world. The practical suggestions he has made would, if adopted, make a general and considerable step in this direction, and immediately secure one desirable object. It is important that the Councils of the various societies should be informed whether the papers submitted for publication are clearly expressed, and so have the opportunity of rejecting or referring back those that are deficient in this respect, but unless a competent committee undertakes the laborious task of literary correction, in some cases practically re-writing the memoir, such rejection may result occasionally in the loss of valuable contributions. Sir Archibald Geikie has told us that in the Royal Society this report and correction are provided for. Mr. Galton has invited discussion on ways and means for securing a better literary style for such memoirs in the future, and has referred to the necessity for more adequate preliminary training, and on this point I venture to make an observation. It would not be practicable to require students of science to follow the best plan for acquiring a good style of composition, namely, to obtain a first-hand acquaintance with the classics of English literature, though such labour would bring its own reward. Time is short, the practical interrogation of Nature is absorbing; we must not expect investigators to turn aside into the "quiet" - Milton called it, of literary study, however it is not necessary. The object is not to study Addison or a Ruskin, still less the though something might be said in favour of attractive ease and simplicity of Charles Le Thackeray. The remedy I suggest is a foreign to the main purpose of the life of science as the study of general English be. It is simply to give more time and specific study of scientific method. Too case that the author of a badly written "calculator of distances, or analyser of tabeller of species," and nothing more. I claimed for the study of science that memory with understanding, cultivates transitorily appeals to individual reason, develop of character, requires perseverance and s contributes sincerity, and gives moral, and religious culture.

All this is more than is wanted for the but that exactness of statement and that expression, which are desired, arise from clear and an orderly habit of mind, qualities which by fidelity to the principles of scientific these should be thoroughly understood engaged in scientific research will not be di are best mastered by coming into close most eminent teachers through the wor have applied them. It should, I think, be for every scientific student, irrespective to master one or more of the works of Tyndall, and Herbert Spencer. The disc would soon reveal itself in more systems in greater precision of expression.

Mr. Emanuel Green, who presided in absence of the Earl of Halsbury, express the meeting to Mr. Galton for his pa Pember for reading it.

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A. Ames, Secretary.—Mr. Galton has added many public services by calling attention to yoved literary form in the papers in which cries are presented to the world. The prac- ses he has made would, if adopted, make a siderable step in this direction, and immu- re desirable object. It is important that the various societies should be informed whether nitioned for publication are clearly expressed, opportunity of rejecting or referring back efficient in this respect, but unless a com- e undertakes the laborious task of literary e cases practically re-writing the memoir, ay result occasionally in the loss of valu- ns. Sir Archibald Geikie has told us that societ ific report and correction are pro- Galton has invited discussion on ways and ing a better literary style for such memoirs d has referred to the necessity for more inary training, and on this point I venture evation. It would not be practicable to s of science to follow the best plan for t style of composition, namely, to obtain a nstance with the classics of English litera- much labour would bring its own reward. the practical interrogation of Nature is absorbing; we must not expect investigators of physical phenomena to turn aside into the "quiet and still air," as Milton called it, of literary study, however delightful, and it is not necessary. The object is not to seek the elegance of an Addison or a Ruskin, still less the art of the poet, though something might be said in favour of imitating the attractive ease and simplicity of Charles Lamb, De Quincey, and Thackeray. The remedy I suggest as effective is not so foreign to the main purpose of the life-work of a man of science as the study of general English literature would be. It is simply to give more time and attention to the specific study of scientific method. Too often it is the case that the author of a badly written memoir is the "calculator of distances, or analyser of compounds, or labeller of species," and nothing more. Herbert Spencer claimed for the study of science that it exercises the memory with understanding, cultivates the judgment, continually appeals to individual reason, develops independence of character, requires perseverance and self-renunciation, contributes sincerity, and gives moral, intellectual, and religious culture.

All this is more than is wanted for the purpose in hand; but that exactness of statement and that simplicity of expression, which are desired, arise from clearness of thought and an orderly habit of mind, qualities which are developed by fidelity to the principles of scientific method. That these should be thoroughly understood by everyone engaged in scientific research will not be disputed, and they are best mastered by coming into close touch with the most eminent teachers through the works in which they have applied them. It should, I think, be made compulsory for every scientific student, irrespective of his specialty, to master one or more of the works of Darwin, Huxley, Tyndall, and Herbert Spencer. The discipline so afforded would soon reveal itself in more systematic thinking and in greater precision of expression.

Mr. Emanuel Green, who presided in the unavoidable absence of the Earl of Halsbury, expressed the thanks of the meeting to Mr. Galton for his paper, and to Mr. Pember for reading it.