cies for each genus. The genera of bees given in the New Jersey and Connecticut lists are those recognized by Viereck, but his views correspond with, and were probably somewhat determined by those of Cockerell, Crawford, Swenk, Sladen, Lovell and Ellis. While these authors might have different views in a few cases, the difference would hardly affect the averages.

	Species	Genera	Average
New Jersey, 1910:			
Hemiptera	504	205	2.4
Lepidoptera	2,120	715	2.9
Coleoptera	3,092	1,079	2.8
Diptera	1,661	542	3.0
Non-aculeate Hym	1,078	408	2.6
Lower Aculeata	452	99	4.5
Total	8,907	3,048	2.6
Bees	250	34	7.3
Genera suppressed		18	4.8
Connecticut, 1916:			
Non-aculeate Hym	1,819	481	3.7
Lower Aculeata	361	118	3.0
Total	2,180	599	3.6
Bees	231	35	6.6
Genera suppressed		31	3.5
Carlinville:			
Hemiptera	21	18	1.1
Lepidoptera	95	71	1.3
Coleoptera	137	82	1.6
Plants	437	261	1.6
Diptera	403	234	1.7
Non-aculeate Hym	126	74	1.7
Lower Aculeata	209	84	2.4
Total	1,428	824	1.7
Bees, R., 1918	296	98	3.0
Ashmead, 1899	296	50	5.9
Cockerell, 1918	296	45	6.5
Cresson, 1887	296	38	7.7
Dalla Torre, 1896	296	32	9.2

The table shows that, as regards genera, the lower aculeate hymenoptera and the bees have been neglected. Even 98 genera are conservative. On the analogy of the 1,428 species of other groups the 296 local bees should be referred to about 174 genera. The 250 New Jersey bees ought to be referred to about 96 genera, and the 231 Connecticut bees to 88 genera.

From the table we may presume also that when the number of species to the genus averages more than 1.7 for a locality like Carlinville, or more than 2.6 for a region like New Jersey, the generic determinations are erroneous. The table also establishes the presumption that the genera of bees suppressed in the New Jersey and Connecticut lists were suppressed erroneously. If the genera mentioned and suppressed in the two lists were used the average would be 4.8 for New Jersey and 3.5 for Connecticut.

To avoid the conclusion that these generic determinations are erroneous it is necessary to show that the genera in the other groups are not correctly determined, or that the bees differ from all of the other groups in a lack of characters on which generic distinctions can be based.

CHARLES ROBERTSON

CARLINVILLE, ILLINOIS

THE NECESSITY FOR BETTER BOOK AND NEWSPAPER MANUFACTURE WITH RESPECT TO MATERIALS USED

OWING to the effects of the present war many of our productions have suffered greatly in quality. Manufactures of all kinds that, five years ago, were as fine in all particulars as the world has ever seen turned out anywhere, have now depreciated to such an extent, in proportions and quality, that one would hardly believe, without due comparison, what an enormous falling off there has been in many instances. It has affected the output of nearly every one of our best industries, with possibly the exception of the manufacture of war munitions, war materials, and some others too well known to mention. There are thousands of newspapers published in this country. Some of the wealthier ones do not seem to have suffered much, while in the case of the majority of the smaller sheets, they have not only shrunk in the matter of their size and number of pages, but the materials used in their manufacture, notably the paper and ink, are so poor in quality that the paper, in an incredibly short space of time, becomes more or less brittle, yellow, and blotchy, all of which are but premonitory symptoms of a crumbling away—a condition that proceeds

pari passu with a fading of the ink used in printing which was, initially, of a very indifferent quality in all respects.

Now, if we take the best newspapers of the country as a whole, it goes without saying that they do and will carry the great bulk of reliable contemporary history of this war. They obtain their war news direct from a dozen or more of the very best and most reliable sources; and while they may make errors on any particular day with respect to such news, those errors are invariably corrected, in the same media, usually within short periods afterwards.

A surprisingly large number of our newspapers are now printed on the very worst paper imaginable and with inks that fade and blunt the type. All this makes for the prompt and permanent destruction of current history, and especially of the military history of the war.

So much for the newspapers; but that is not the worst of it, for what applies to newspapers is equally pertinent with respect to book and current literature generally. Books of the greatest possible value representing the literature of every department of science and research, of history and current fiction, and many other lines, are now being printed with blunt type on the most perishable kinds of wood paper, and bound in such ways that they go to pieces in an incredibly short space of time. This stricture not only applies to what is being done along such lines in this country, but likewise by most of the nations that are doing any publishing in Europe.

In other words, we are not making books on standard or any other kind of literature nearly as good, in so far as their lasting qualities are concerned, as they did in the fourteenth and fifteenth centuries. This fact I recently touched upon in an article I published in the *Medical Review of Reviews* of New York City, on the "Incunabula in the Library of the Army Medical Museum of the Surgeon General's Office." Few studies in books are more interesting than to make such comparisons as these; take some of the best volumes for instance published in 1450 and compare them with any of the best works in contemporary science and mark the difference.

It is truly marvelous to note the general quality of the work they put out in those early days—now nearly five hundred years ago. To be sure the illustrations are generally crude, while the binding, paper and printing are far and away ahead of fully fifty per cent. of the same kind of output of the present time.

No one of my present acquaintance is more familiar with all these matters than Mr. Felix Neumann, of the Library of the Surgeon General's Office, and he has, a few days ago, been so good as to submit me the following notes on the subject which have never been used in any other connection heretofore. Mr. Neumann points out that:

> Periodicals and newspapers, the latter very important sources of contemporary history, are printed on such poor paper that it is very doubtful how long they will last and how long they can be preserved in libraries. In some libraries they are kept, as a matter of protection, in an entirely dry room and not loaned for use in private residences. As these periodicals and newspapers are of the greatest importance, it is desirable that those copies to be deposited in libraries should be printed on special and more durable paper. In England, for instance, there exists a law issued in the seventeenth century that the copies designated for the library of the king and for the libraries of Cambridge and Oxford, should be printed "on the best and largest paper."
>
> An indifferent paper had already been in use at different periods. For instance, in the first half of the seventeenth century, during the Thirty Years War, the durability was not to be blamed so much as the poor quality of the paper. Many of the books printed during this period were printed on a brown paper. Such matters became still worse in the seventies of the last century, at which time many publications were printed on paper made from wood-pulp which at that time came into vogue. In consequence of this indifferent manufacture many books and bound volumes of scientific periodicals had to be reprinted by an anastatic process, as the originals had fallen to pieces.
>
> The deterioration of printed paper of poor quality depends greatly on the influence exerted by light and heat, although paper of better quality suffers sometimes from the same reasons. Taking all this into consideration, it is advisable that the government should supervise the examination of all

paper, or that the Bureau of Standards should serve to the same end. Our technical institutions and colleges should also pay more attention to the manufacturing of paper and should add to their curriculum the manufacture of paper and lectures on the paper industry.

But far more important is it that publishers and libraries and learned institutions should work together in such matters to the end that all publications, books as well as periodicals, to be used and preserved by such institutions, should be printed on paper of good lasting quality. Such publications must have printed on their title-pages the words, "For Library Use." To be sure, publishers will charge more for such copies than for the ordinary ones. The libraries and learned institutions will gladly agree to this. The same would apply to certain newspapers.

I must believe that what has been pointed out above will be sufficient to invite attention to this most important question; and as the space in these columns is of unusual value its consideration will not be further touched at this time.

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THE CANONS OF COMPARATIVE ANATOMY

IN the discussion in this journal[1] of the so-called canons of comparative antaomy as illustrated in the vessels of angiosperms and *Gnetales,* Professor E. C. Jeffrey employs his canons (!) in the familiar methods of the believers in *schrecklichkeit.* As such methods in any field of activity have very little effect on the real issues, the writer declines to be drawn into tempting retaliations or into discussions of unnecessary side issues apparently intended as diversions, but proposes to end the matter, so far as he is concerned, with a simple summary of the facts and the conclusions which have been drawn from them on both sides.

1. Two of the canons (recapitulation and conservatism in certain regions) are beautifully illustrated in connection with the vessels in question. In regard to this statement Professor Jeffrey and I are in entire agreement.

[1] SCIENCE, N. S., Vol. XLVII., Nos. 1214, 1221 and 1231.

2. The porous perforation of the vessel of *Gnetum* has been evolved by the enlargement and coalescence of circular, haphazardly-arranged perforations (*Ephedra* type) which are themselves in turn derived from typical bordered pits. In regard to this statement also Professor Jeffrey and I are apparently in entire agreement; at any rate our disagreement is not based on it.

3. The similar porous perforation of the vessel of higher angiosperms has been evolved by the disappearance of the bars from the perforations of the scalariform type found in lower angiosperms. With this statement Professor Jeffrey was in entire agreement when his very recent and excellent book "The Anatomy of Woody Plants" was written. On page 379 of that work he wrote, "The vessel with the porous type of perforation is clearly derived, as has been demonstrated in an earlier chapter, from the scalariform condition." (See also pages 101 and 102.) In his latest contribution to this discussion he states, however, that in some cases it originates as described in statement (2) for *Gnetum.* Nevertheless, inasmuch as he gives no instances of this phenomenon in angiosperms, and does not even mention it in his book, we may conclude that statement (3), which is merely another way of expressing his own quoted statement, is essentially correct.

4. From (2) and (3) it follows that the porous vessels of angiosperms and *Gnetales,* though similar, have been evolved in entirely different ways and therefore have no genetic connection. They can not, therefore, be used as evidence of relationship between these two great groups of plants. From this statement Professor Jeffrey dissents, apparently believing that it is not a legitimate inference from the given premises. To the writer it appears to be the only logical inference.

W. P, THOMPSON

QUOTATIONS

THE COORDINATION OF SCIENTIFIC PUBLICATION IN GREAT BRITAIN

THE Faraday Society arranged a meeting to consider the "Coordination of Scientific Pub-