the god Nin-ghir-sou has erected." We read, also, in another inscription behind the head of the king: "Nina-Our, King of Sirpoula," and a little above his knees: "from Magan in the mountain quantities of wood he has ordered," and after the last personage figured: "the temple of the goddess Nina he has erected."[1] We are evidently in presence of a very pious prince, and we know from other sources that he erected or repaired a certain number of temples dedicated to his gods. All the figures and inscriptions show a most primitive art, inferior to that dating from the days of E-anna-dou. They are nevertheless of high value as historical and genealogical records.

The importance of these discoveries cannot be overrated. That importance resides not only in the insight they bring on the customs, wars, and religions of nations whose very names were unknown but a few years ago, but also in the greater antiquity we must now accept for the origin of man himself. The dates given for the creation must be amended, as we know now with certitude, that in those days men and nations already existed in numbers, towns were built, monuments were erected, arts were flourishing, kingdoms already powerful were in existence, and we find both in Asia and in Africa traces of a civilization which centuries alone could have reared and maintained.

AN EXPERIMENTAL BASIS FOR LITERARY CRITICISM.

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THE volume, entitled "Analytics of Literature," just published by Ginn & Co. of Boston, seems to the writer so epoch-making a work that he takes advantage of the courtesy extended by *Science* to direct the attention of scientific men in general and biological students in particular to the new and brilliant application in it of the familiar methods of research which they have themselves used in other departments of investigation. The truth is that there is the emergence of a new science — the science of experimental criticism, or, if one likes, the science of style-morphology, embryology, and physiology. It is a most noteworthy volume, and though unpretentious and perhaps marred by departures here and there from the strict scientific method, it will take its place with such a work as that of Fechner, in which he brought recalcitrant psychology under the laws of empiricism, and banished the intuitional and closet-metaphysician in the ratio in which he introduced the laboratory method of psycho-physics and the experimental psychologist of the school of Wundt. No more far-reaching scientific work has been done in America than the reduction, in this book by Dr. L. A. Sherman, of so mysterious a matter as literary style to the basis of a department of experimental science. But after an acquaintance with the method and an application of it, during the ten years past in which it has been laboriously and carefully developed by its originator, I have no hesitation in pronouncing the work an extraordinary and inspiring advancement of biological methods into a field where, oddly enough, they have not before been employed.

The new point of view is simply this: style is an institution. It may be considered apart from the message which the writer wishes to convey. Under such an analysis style is found to obey the laws of other institutions or organisms. It is a matter of evolution. It is in any case a structure of which the phylogeny and the ontogeny may be calculated. In the child, one may study the ontogeny of a style, and of children's phases of sentence development the author of "Analytics of Literature" gives some valuable examples. And in the literature of the English-speaking peoples there is a vast storehouse of palæontological material from the study of which, after comparison with the ontogenetic development, it is possible to determine some of the laws of style-evolution. Thus a foundation for a style taxonomics is laid and one finds that, as one should expect, all the well-known laws of heredity in general and of progress, degeneration, variation, reversion, or atavism, persistence of type and modification of type in particular, apply to literary styles precisely as to organisms. It becomes possible to determine a style, not in the old intuitional manner of literary art as indicated in Sainte Beauve, Arnold, or Lessing, but in the precise manner of the zoölogical monograph. It becomes possible to establish genera, species, tribes, orders, if one will, of literary style, and the whole matter of literary criticism at one touch passes over into the domain of natural science, just as music so passed in the thought of Schopenhauer and Wagner, metaphysics under the hand of Wundt, biology by the genius of Aristotle, Bacon, and Darwin.

The genesis of such a work must be of interest. As indicated in the preface it was a development, not an inspiration. The first published paper that pointed out the objective method in criticism, so far as known to the writer, was that of Sherman in the *University Studies*, October, 1888.[2] Here the matter of enquiry was the changing length of the sentence in English prose and a number of statistics were presented. It was shown that there has been a progressive shortening of the sentence from early pre-Elizabethan prose to the present. Some data are added here by way of illustration. They are taken from both the *Studies* article and from the recent volume.

Average number of words to the sentence in various English writers, computed from prose, on the basis of five hundred sentences.

Chaucer,	40.+	Browne,	33.40
Thomas More,	52.+	Fuller,	32.80
Lyly,	52.22	Addison,	37.90
Roger Aschman,	42.+	"Junius,"	31.90
Sidney,	50.65	DeQuincy,	32.28
Fabyan,	63 02	Matthew Arnold,	37.
Spenser,	49.82	Lowell,	38.
Hooker,	44.+	Pater,	36 5
Bacon,	22.	Macauley,	22.45
Dryden,	45.26	Channing,	25.73
Bunyan,	37.50	Emerson,	20.58
Milton,	60.80	Bartol,	15.97

These averages once established may be tried in other parts of the works of any author and will be found practically constant. For example, in Macauley's "Essays" the average length of the sentence is 23.+. Testing by the "History of England" it was found that in this the average of the 41,579 periods counted is 23.43 words per sentence. Thus it can be shown in any author who has acquired a style that five hundred or a thousand sentences taken at random will establish a sentence-norm for that author and from this norm the variation will be slight. Disparities, too, are greatest in more ancient styles, indicating their less complete organization. For example, in Chaucer the average of Melibœus is 48.+, while that of the Parsonn's tale is 36.+, an almost unparalleled discrepancy.

It is possible, then, for any author to plot a curve of sentence-length, and when this is done the surprising fact stands forth that the average is brought about by "evening-up" a comparatively large number of sentences only a little shorter than the mean with a comparatively few sentences excessively long. Since the long sentence is clearly shown by palæontologic investigations to be the older type in any literature, it appears that in modern stylists, even, there is an atavistic tendency, and this is capable of beautiful and instinctive comparison with the persistent styles of low type that can be picked up anywhere — in newspaper-advertisements or in cheap novels — where, if there is an independent style at all, it will be one of older and lower organization.

Even in the preliminary analysis of sentence-length, singular and unintelligible facts have been discovered that demand further investigation before their import can be known. DeQuincy is peculiar in the number of prime-sentences, those in which the number of words is indivisible by any quantity but the number itself and unity. Curious lapses into ancient manner in moderns and astonishing forecasts of modern manner by ancients

[1] Amiaud, "Records of the Past," T. I., p. 64; Jensen, "Keilenschriftliche Bibliothek," T. III., p. 10.

[2] On the Sentence-length in English Prose, pp. 119-130.

— as. for instance, in the case of Bacon — attract one's attention. But space permits of no extended indication of these points.

Next to the shortening of the sentence, a decrease in predication is a striking fact in the evolution of the prose-style. While in earlier writers the per cent of simple sentences is small, it rises rythmically to a high average in modern stylists. The following examples will illustrate:—

	Per cent Simple Sentences.		Per cent Simple Sentences.
Chaucer,	4	Shaftesbury,	27
Spenser,	11	DeQuincy,	14
Hall,	7	Macauley,	39
Sidney,	10	Channing,	31
Hooker,	12	Newman,	16
Barrow,	15	Emerson,	37
Addison,	12	Lowell,	23
Bacon,	19	Grant,	31
Bunyan,	10	Everett,	32
Bolingbroke,	13	Bartol,	45

The laws of shortening and simplifying the English prose-sentence may be derived from comparative morphological studies in styles, or better by the assistance of ontogenetic or embryological work. The latter method is called in by Dr. Sherman in the series of comparisons between the style of speech of the child and the literary styles in the phylogenetic series. The stages in either case are found to be (a) monosyllabic exclamation, (b) predication, (c) co-ordination of predications, (d) sub-ordination of some predications to others, (e) suppression of less important predications. Examples from the early lispings of childhood are brought side by side with others selected from the field of English prose and a statistical enquiry, most subtle and ingenious, is instituted into the various percentages of illative, temporal, causal interior and exterior conjunctions in different writers. The result, simple as it seems when once fairly grasped, is no less splendid an achievement of the biological method in its new application. There is in the child, as it learns to talk, a recapitulation of the phases through which the English writers of prose have passed in their development of the modern style. The record of the palæontological series tallies with that of the embryological and one can explain the changes from the earlier styles to the later by the same laws that one sees at work in the child as he learns the art of speaking and of writing.

In the discussion of poetry the same scientific method may be used, and its employment is indicated, but somewhat less fully, by Dr. Sherman. In the portion of the "Analytics of Literature," which is particularly devoted to the poetic side of English, the most notable discovery is doubtless the law of intensification, through which, when associations were few, the poetic idea demanded a whole sentence for its vehicle, as in Chaucer; but as the association value of words increases the poetic idea can be carried by clauses, as in Shakespeare, by phrases as in Keats or Shelley, and, finally, by single words, as excellently illustrated in Browning. This discovery is made the basis of a scientific analysis of different poetic styles and the results obtained while new are of the deepest value. Things before mysterious and the subjects of vatic utterance by the various critics, become suddenly transferable to the solid ground of experiment and calculation. Poetry is no longer presented to one as something to be intuitionally appreciated but as an object of experience and of analysis after the ordinary methods.

On the whole, it is not possible to commend too highly this new departure in a field which has long lain in darkness, awaiting the light of science to make its laws and phenomena generally apparent. The adoption of such clear-cut, substantial, experimental foundation in rhetorical courses in colleges and schools cannot but be of the highest utility. It is evident, furthermore, that a vast untried territory is now discovered to those who wish to engage in useful research. It becomes apparent how halting and poor is former critical method when one notes what tremendous conquests of unknown facts are possible through this single pioneer work. The study of literature — after the usual objection and objurgation from those not yet in sympathy with the unifying power of the scientific method—promises to take its place not as an art, but as a science of the biological series. Too much praise can hardly be laid upon the writer of this work which so definitely hands literary criticism over into the hands of scientifically-minded men.

IN REGARD TO COLOR-BLINDNESS AMONG INDIANS.

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THE fact that blindness to certain colors exists among civilized people, is well established; also the percentage of cases to be found among males has been determined with considerable probability for the races of Europe and America. There has been much diversity in methods of testing, and the results of many reported determinations might well be called in question. Still, it is probably not far from the truth that four out of every hundred males are more or less deficient in color-sense. Of females, there have been reported (B. J. Jeffries, M.D., 'Color-Blindness," p. 85) as examined in Europe and America, 39,828, and of these only 60 were color-blind, or two-tenths per cent. Of both males and females, 156,732 have been tested, and of these 5,417, or 3.52 per cent, were color-blind. These statistical facts have naturally excited interest and discussion. If so large a number as four out of every hundred are unable to distinguish colors, there arises, of course, a practical question, important to the railroads, marine, etc.

The gravity of this fact is already recognized more or less in all countries, by the test-examinations for color-blindness among employés. But there is in these statistics also much of interest to scientists.

Most cases of color-blindness are found to be congenital and are incurable. Many have been produced by disease, some by violent concussions in accidents, and some by excessive use of tobacco and alcohol. Temporary blindness to violet may be induced by santonine. From these facts several interesting questions have suggested themselves to us. If color-blindness follows the laws of heredity, is it on the increase or decrease? Further, is it a product of civilization? The first of these queries can be answered only by statistical data extending over long periods of time. The second naturally suggests a comparison: first, of the color-sense of civilized nations among themselves; and second, of civilized with uncivilized peoples.

Of tests on native tribes, we can find but two recorded — those of Dr. Favre on some tribes in Algiers, and those of Dr. Fox on 150 American Indians, but where we do not know.

First, for the comparison of civilized tribes among themselves we have calculated the following percentages from tables reported by Dr. Jeffries:—

Countries.	No. Examined.	Per Cent Color-Blind.
Austria	5,250	3.79
Denmark	5,840	3.74
Belgium	8,106	4.13
Holland	2,300	1.43
Finland	1,200	5.00
Norway	205	4.88
Sweden	32,504	3.73
Switzerland	3,024	5.36
Germany	6,344	4.12
Russia	12,830	3.30
Italy	2,065	2.32
England	16,431	3.75
United States	44,844	3.64

Average per cent, 3.76.

No great reliance can be placed upon these results. The numbers examined are too small, the methods of testing not uniform or equally reliable. However, the probabilities of error are almost equally distributed, so that the conclusion is fairly well