

SCIENCE

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LOGARITHMS ON THE 'SPOILS SYSTEM.'

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WHILE the President of the United States is considering whether he will follow the advice of the naturalists of the country and appoint as Fish Commissioner a really competent man, or accept the recommendation of one of his political friends and select a man who, in the opinion of that friend, knows nothing of the duties of the position, but will 'catch on' if he is given a little time, a good many other people are examining, with no small degree of astonishment, a recent example of the results of managing one of scientific bureaus of the government on the spoils system.

This bureau has just issued its Annual Report, a large quarto volume, and of its 720 pages 325—nearly one-half—are given to the publication of a ten-place table of logarithms! If there never had been a ten-place logarithmic table before this there might be a shadow of an excuse for its publication by the government, but when such tables have been available for more than a hundred years, and can be bought almost anywhere for a small sum, it is difficult to imagine a reason for the printing of this one. Just what it has cost the government from first to last cannot very well be esti-

mated, but it has been put at not less than \$20,000 by a widely known newspaper.

In the bureau from which it comes perhaps two or three copies of such a table might be used, but anybody who knows anything about the subject knows that useful tables of logarithms include from four to seven places. The number of problems in which a table of more than seven places would be used is extremely small, and all extension of figures over what are actually used are a nuisance and a real hindrance. That the United States government should suddenly print for free distribution several thousands of copies of this compilation must create, among those who understand, a strong suspicion of a dearth of other printable material.

A little examination of the introductory pages of this extraordinary work will intensify the wonder which its appearance produces. Some space is devoted to the consideration of the elements of trigonometry, assuming that young people who are ignorant of that subject will take to ten-place logarithms from the start.

Mathematicians will be interested and amused by this elementary work, which would properly astonish a high school pupil of the present day. Definitions of the trigonometric functions are quite erroneous and quite inconsistent with accompanying statements. Some novel mathematical principles are laid down, which go far to make the work worthy of preservation. But all of this goes for nothing at present, as no table of logarithmic sines, cosines, etc., appears in the present volume, and it is greatly to be feared that a new administration with

less decided antiquarian tendencies may insist on the paramount importance of papers on hydrography, magnetism, geodesy and things of that sort, and thus defer the completion of this table for another hundred years.

The past is secure, however, and the ten-place 'logarithmorum vulgarium' cannot be taken from us, unless, indeed, the government calls in 'for redemption' the entire issue.

The printed tables show that they have been prepared for the select few, meaning the very select few who are ever likely to be found making use of them. Their arrangement might have been worse, but only by printing the numbers in one annual report and their logarithms in the next. No one will deny this who looks at the two broad quarto pages and tries to carry the line of a number, found only at the extreme left, across both pages to the corresponding logarithm, without being 'shunted off.' This difficulty is greatly enhanced by a gap of about three inches of blank paper diversified with binding stitches, over which one is expected to carry one's eye undeviatingly. Still further trouble comes from the absence of all grouping in the individual numbers. Seven figures, and ten figures, where there are ten, are packed up together, while in any well arranged table they are always grouped in blocks of two, three or four, so as to catch the eye readily and to be the more surely carried correctly in the head until written down. Every compiler knows how this matter of grouping and spacing may make the difference between a perfect table and one which is absolutely unusable.

Many other points might be commented upon, but it was not intended to make any extended criticism of a work which quickly proves to be unworthy of extended notice, except as an example of how a government may spend its money during a 'reform' administration. Of the fitness of the author for the task he has undertaken he has himself given the most valuable testimony. He says, "When these computations were begun I was not aware that Baron George von Vega had preceded me in his *Thesaurus Logarithmorum Completus*." This great work of Vega, which every tyro in computing knows, was published in 1794. This is more than a hundred years ago, and it is not easy to understand how one could seriously think of repeating such a performance without finding that it had already been done. The author thinks he has discovered some serious mistakes in Vega, but he delicately refrains from telling what they are, nor does he say that he has yet learned (a hundred years not having elapsed) that in 1889 Vega's tables were freed from all known errors, those discovered during a use of about one hundred years, and republished in Europe in a cheap form by a process prohibiting additional typographic blunders. Had he known this he must certainly have informed the Secretary of the Treasury that the expense of the present publication might be avoided. Not liking to imitate Vega in every respect, he adopted a different arrangement of numbers and logarithms, which he says is the same as that of 'the admirable tables published by Messrs. W. & R. Chambers, London and Edinburgh, 1885.' For this statement the

Messrs. Chambers are surely entitled to action and recovery.

It is but just to the many able and distinguished scientific men serving in the bureau from which this publication comes to say that it was prepared by their chief, published under his name and by his order. They have had nothing to do with it, except, doubtless, to reduce, as far as possible, those errors which yield to ordinary 'proof reading.' Nor must the author be blamed severely, as he is rather deserving of pity. For this costly and worse than absolutely useless production the country is indebted to the 'spoils theory' in politics, and it represents but a minute fraction of what that theory has cost in government scientific work alone. We have good reason to hope that the present administration will avoid the mistakes that must follow in the wake of politics applied to the great scientific bureaus of the government.

THE UNITED STATES NAVAL OBSERVATORY.*

THE history of the Naval Observatory, since its separation from the Hydrographic Office, will naturally be looked for in its annual reports, which are found in the reports of the Navy Department. In 1866 the building of a splendid new observatory was commenced on such a scale that several years were required for its completion. In 1894 Secretary Herbert framed regulations for its government, the most impor-

*We have been requested to reprint this article from the *New York Evening Post* of January 19th. If the criticism of the trivial character of the work of the Observatory is well founded the matter should be brought to the attention of those interested in the efficiency of the scientific work of the government. If the strictures are incorrect those responsible for the management of the Observatory should be allowed to reply in a scientific journal.—ED. SCIENCE.