INFLUENCE OF THE EARTH'S ROTATION ON THE FLOW OF RIVERS.

Mr. G. K. Gilbert contributes a new element to the discus-sion of "the sufficiency of terrestrial rotation for the deflection of states of streams, in a paper read to the National Academy of Science in April, and recently published in the American Journal of Science, which is presented by Science as follows: Taking Ferrel's measure of the defl-ctive force that comes from the earth's rotation, Mr. Gilbert shows, by a remarkably simple consideration, Mr. Gilbert shows, by a remainably simple the whole strain, that its value is not so much in throwing the whole strain the swifter stream against its right bank, as in selecting the swifter threads of the current and carrying them against the bank; and, further, that this action will have especially well marked development in meandering streams, where it will aid the cut-ting ting on the meanders of right-hand convexity, and diminish it on the meanders of right-hand convexity, and diminish it on those of left-hand convexity. For the Mississippi, the selective tendency thus determined toward the right bank is nearly hearly nine per cent. greater than toward the left; but it is not stated that the valley form has been noticeably affected by this preference that the valley form has been noticeably affected by this preference. On Long Island, however, the form of the valleys is clearly the form of the valleys and the valleys are the form of the valleys are the valleys are the form of the valleys are the valleys are the form of the valleys are the form of the valleys are the form of the valleys are the valleys are the form of the valleys are th is clearly controlled by the earth's turning, as was first suggested by Mr. Elias Lewis some years ago, and recently conarmed by Mr. J. C. Russell.

The article by Mr. Gilbert advances the question not only by properly applying the law to rivers flowing in any direction, but further by giving it a more delicate analysis than it has case the form of a valley may be decidedly influenced by this geographers, the method of analysis has a wider importance. The application of mathematics to terrestrial physics has too or idealized form that departs too widely from the complicasupposed demonstration. This was notably the case with the steculations. It is therefore gratifying to find that increased tially from a close consideration of the actual rather than of the tion of mathematics as well as in the explanation of facts.

The lateral tendency of rivers was first noticed in the case of le Val the Volga, which undercuts its right bank, as it should in this hemion the Volga, which undercuts its right bank, as it should in this hemisphere. Other examples are found in North Cirolina, in the channels of the streams flowing eastward to the coast, where the streams flowing eastward to the coast, where the streamer: again on Long where the southern banks are the steeper; again on Long Island, and on the plains of New Zealand. But the radical Valleys of Valleys of south-western France afford better illustrations than any of a any of these, inasmuch as their forms are accurately shown on the prost the great map of the army engineers. North of the Pyrenees, about the map of the army engineers. about the towns of Tarles and Auch, there is an old sandy delta deposit deposit spread out by the rivers from the mountains while this region its elevation, the region was still under water; and since its elevation, the atreams formed upon it all follow its gentle slopes, diverging like the site of upon it all follow its gentle slopes, diverging like the ribs of a fan from the higher centre toward the lower margin ribs of a fan from the higher centre toward the old delta Margin, and cutting down their channels into the old delta plain. There is nothing here in the flat layers of unconsolidated sands to determine an unsymmetrical form in the valleys; and vertices of the sands to determine an unsymmetrical form on the valleys; and yet they all show most distinctly a gentle slope on the left, and a start of the start of the slope of th and a steeper slope on the right; longer lateral branches on the left, and shorter ones on the right; and many of the high-ways. Ways, constructed parallel to the streams on the as yet un-broken nutricited parallel to the streams on the streams on their left broken uplands, are clearly closer to the streams on their left than on their streams direct effect of the earth's $t_{ban}^{U_{aen}}$ on their right. All this is a direct effect of the earth's rotation

It is customary, in speaking of the deflective force that arises from the earth's rotation, to say that it acts to the right in the reason for this is not found in a change in the direction of the as it only in a change in our way of looking at it. It is here, but only in a change in our way of looking at it. It is here as should look at the face of a watch in the northern then, on going to the southern hemisphere, look at the back of therefore suggest that the hands turn to the left. Let us paper elook at their winds and storms and streams from the this would involve them in the slight inconvenience of standseing that the deflective forces of the earth's rotation, as well as the hands of their watches, "always make for the right."

HALF-HOUR WITH THE FLOWERS USED IN PER-FUMERY.*

BY W. A. WRENN.

Allow me to claim your indulgence to deviate slightly from the literal translation of the title of this paper, as, in addition to flowers, I have added a short description of some substances used in the manufacture of perfumes and toilet essences, either for the purpose of fixing the odor, such as ambergris, or as is required in some cases to develop the scent of certain flowers susceptible to such influences, and to give them preponderance, such as musk; or, again, to make a distinctness of their own, such as that caused by the addition of acid benzoic.

Doubtless some may think such a paper as this rather out of place among pharmaceutical and chemical data. What right has the pharmacist to engage in the compounding of perfunes —why not leave it to the coiffeur or perfumer proper ? is a question which has been asked more than once, and opinions have been much diversified. I myself regard the manufacture of perfumes as a very suitable adjunct to the varied duties of the pharmacist. A sensitive nose is a very useful appendage to a chemist's physiognomy; and what can be a more crueial test than the continual intercourse with essential oils and their varied aroma to detect the numerous admixtures and sophistications which are of every-day occurrence?

Again, the peculiar odor of a pharmacy, so attractive to feminine whimsicalities, is due in the main to the excess of the odor of the perfumes and essential oils over the more nauseous aroma of drugs proper; while in the matter of \pounds s. d. I think a unanimous opinion exists.

With these preliminary remarks I will ask the attention of those who, perhaps, have passed over in recollection the interesting and varied metamorphoses between the time flowers are seen in the fields and their ultimate deposition as concentrated extracts in a toilet bottle.

A half-hour is such a limited space of time to treat such an interesting subject that I have decided to mention only those flowers, fruits, etc., which are more largely used. These are bergamot, cassie, cloves, heliotrope, jasmin, lavender, lemon, mignonette, narcissus, orange, patchouli, pelargonium, rose, rosemary, thyme, tuberose, verbena, and violet; and briefly note ambergris, gum benzoin, musk, orris, tonquin, and vanilloes.

Bergamot, the essential oil obtained from the fruit of Citrus bergamia. It is very similar to the lemon, being golden yellow in colour externally, smooth peel, and pale yellow pulp. The flowers, however, resemble those of the bitter orange. The tree Citrus bergamia is cultivated in Sicily, and more especially in the neighborhood of Reggio. The oil is obtained by expression, though formerly by the sponge process, from the fruit in a partly unripe state, gathered in the end of the year —November and December. The quantity of oil obtained is about 3 oz. from 100 fruits. The oil, when newly prepared, deposits a albuminoid substance, and in a month or so a white fat, called "berg ptene" or "bergamot" camphor. The green tint is due to chlorophyll, which, in a very minute quantity, may be coagulated by heat and separated by filtration, leaving the oil with a brownish tint.

The sp. gr. is about .830 to .890 in genuine samples. Hanbury gives .860 to .830; some samples gave sp. gr. .853 and .865. These were found to be adulterated, probably with turpentine and ess. of lemon, the spr. gr. of the former being as low as .823, and of the latter .832 to .880. The quantity of oil used in perfumery is very great, and the shipments, which are made principally from Palermo and Messina, are still on the increase.

By mixing together-

Ess. bergamot	40 5	cubic	centimetres.
Nitrie soid ap or 1 200	10	"	**
Water	45	"	"

and allowing this to stand for two months, shaking about twice a week, I obtained a fine crop of crystals (sample of which I place before you this evening). They resemble those of terpin hydrate as obtained by Mr. R. H. Parker from oil of turpentine.

Essence of bergamot is a feature in the perfume Ess. Bouquet, said to be a favorite scent of George IV.

CLOVES, the flower-buds from the evergreen Caryophyllus

*A Paper read before the Chemists' Assistants' Association.