because'; the two sentences become one. Of the fourteen words, twelve are unnecessary. Perhaps even the last phrase, 'to be reckoned with,' is a bit superfluous, too."

Translated into the language of the scientist the "excess words" are removed and there results:

"Since the italicized words mean 'undoubtedly because,' twelve are unnecessary. Even 'to be reckoned with' is superfluous." But of course we are belaboring the point. Almost any paragraph or sentence can be condensed, but commonly such reduction engenders rather than aborts "stylistic infelicities," and it usually plays havoc with the original thought as well. Nevertheless, in this day, when the scientist is blamed for most every excess under the sun, it may be well to insist again that he is not generally guilty of "excess words." True, he may not be a hardened criminal simply because he can't help himself. For instance, a recent number of the *Bulletin* of the Geological Society of America contained seven important descriptive papers, all of which had been thoroughly revised by the editorial board. Each had been materially reduced of the "excess word," the longest by as much as 42 per cent., or from 104 pages of manuscript to 60. Moreover, were this particular journal not heavily subsidized, papers of more than 20 pages, however important, probably would rarely be accepted. In the fields of chemistry, physics and mathematics the situation is still more acute, for even epoch-making discovries must be reported on a printed page or two. Instead of "excess words" in such papers there unfortunately may be almost no words at all.

To-day, when politicians, political and social scientists, novelists, administrators and reformers are all wallowing in a plethora of ambiguous words, it is an anomalous situation that many concise, unequivocal scientific statements of some real consequence remain unpublished. Therefore, although I admit both the general validity and value of Mr. Urbach's criticisms, I suggest that if he is really looking for the "excess word" he turn from scientific writings to more likely sources. He might delve into the *Congressional Record,* a metropolitan apartment lease, an income tax form, the public utterances of high officials or a certain novel which requires a thousand pages to portray what General Sherman, a scientifically trained soldier, aptly described in three words.

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## HAS UTAH LOST CLAIM TO THE LOWER SONORAN ZONE?

FEW spots in the West have aroused more interest in the student of plant and animal distribution than a restricted area in the vicinity of St. George, Utah, located in the extreme southwestern corner of the state. The unusualness of this locality lies in the fact that it is a typical Covillea belt of approximately 350 square miles, surrounded on all sides by cold temperate flora except for a narrow, continuous strip of Lower Sonoran vegetation extending along the Virgin River through southern Nevada.

The St. George area has for centuries represented an extreme northern tongue of the southern desert shrub type. In October, 1776, Father Escalante described the presence of mesquite and numerous flowers blooming along the streams in the vicinity of St. George and contrasted the weather here with the bitterness of winter which he encountered but a few miles to the north. Brigham Young in 1850, realizing the semi-tropical nature of the locality, directed the immediate settlement of Utah's Dixie for the expressed purpose of growing cotton. In this part of the state the settlers grew not only cotton successfully, but also semi-tropical fruits, such as figs, pomegranates and grapes of various varieties.

Since the establishment of a weather station at St. George in 1890 sub-zero weather has been experienced in only three winters. On January 2, 1901, a low of −1° F. was recorded, but this extreme was of short duration and no damage to cultivated crops or native vegetation apparently resulted. During the winter of 1909, when low temperatures of −4° F. were recorded for three consecutive days, December 25, 26 and 27, figs and pomegranates were damaged considerably, but the native vegetation seemed to escape noticeable injury. January, 1937, brought the lowest and most extended duration of extreme temperature ever known in the St. George area. The following lows with dates appear in the weather bureau records: Jan. 21 −9° F., Jan. 22 −11° F., Jan. 23 −1° F., Jan. 24 −2° F., Jan. 25 −1° F., Jan. 26 −11° F., Jan. 27 −7° F. Widespread destruction to tender varieties of grapes, figs and pomegranates is now evident, and the chief plant indicators of the Lower Sonoran Zone, such as *Covillea tridentata* and the two mesquites, *Strombocarpa odorata* and *Prosopis glandulosa,* appear to be dead. Whether or not some of this native vegetation will throw new shoots later remains to be seen, but brown, water-soaked cambium layers even at the crown of most shrubs observed throws doubt on this possibility.

Aside from the suddenness with which vegetation may be eliminated from a rather considerable area, the tragedy of this prank of nature has definite bearing on the fundamental concepts of the factors of climate governing plant distribution. Especially does this wide-spread destruction of vegetation due to continued low temperatures emphasize the inadequacy of Merriam's theory of zonation in its failure to take into

consideration temperature data of the dormant period. That the long duration of low extremes of temperature may be a critical factor in the wide-spread destruction of vegetation is further substantiated by the fact that the juniper of the upper limits of the Upper Sonoran Zone of southern Utah are bronze in appearance because of the rigors of the past winter. Whether repopulation of these damaged areas will be accomplished by means of seeds ripened last fall or whether a general altitudinal lowering of these vegetation zones will result, only time will tell.

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## REGENERATION OF ULTRACENTRIFUGED ADRENAL TISSUE IN THE ALBINO RAT

IN a previous paper[1] the writer reported the cytological changes produced in rat adrenal cells by ultracentrifuging at 400,000 times the force of gravity. Briefly, such cells show marked stratification of their components according to relative specific gravity and the viscosity of the medium. In order to determine the capacity of these cells to retain their viability, to reconstitute, regenerate and function normally, autoplastic grafts have been made.

A significant series of rats averaging 50 days age were doubly adrenalectomized, a portion set aside as controls, and the remainder used for transplanting. In the latter group the excised glands were ultracentrifuged for 30 minutes, thereby producing maximum stratification, as described in the paper already referred to. These were then halved and two or three pieces grafted autoplastically into pockets cut into the abdominal muscles. Both the control and the transplanted rats were placed on a salt diet to guarantee a sufficient survival period in which the grafts might "take." After about 30 days the animals were returned to a normal diet to check the efficacy of the implants. Up to the present time (three months after adrenalectomy of the first lot) none of the implanted rats have died, except for a few whose death during the first 72 hours could be attributed to traumatic shock. On the other hand, most of the control animals (doubly adrenalectomized, but without implants) failed to survive even the first 30 days on salt diet. At the present writing some of the implanted animals have been killed, the grafts excised and serially sectioned, and thorough search made for accessory adrenal tissue which included serial sectioning of the original adrenal sites. In the cases so far examined no accessory tissue has been found; however, the ultracentrifuged implants show excellent and abundant regeneration of cortical tissue, but no medullary cells. Cytologically, the cortical cells appear normal, though certain differences in the histological arrangement are apparent. More detailed studies are in progress.

It appears, therefore, that the severe centrifugal displacement of cytological elements in adrenal cortical cells does not hinder these cells from reconstituting, regenerating and performing their normal physiological functions. A complete and detailed account of this work is in preparation and will be published elsewhere.

[1] Dornfeld, *Anat. Rec.*, 65: 403, 1936.

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## ABUNDANCE OF THE EUROPEAN STARLING IN ILLINOIS

SINCE its first appearance in Illinois, about fifteen years ago, the European starling has steadily increased in numbers until it may now be considered a pest almost equal to that of the English sparrow. When first noted in Champaign County by Professor Frank Smith and the writer (1922), it was always observed in company with grackles, never in flocks by itself.

During several motor trips about the state the past winter this bird was observed in certain places in great abundance. On March 7, while passing over route 24 from Peoria to Forrest, eight flocks of starlings were noted, none of which contained less than 100 birds in each flock. The flock was pure starling, no grackles being noted in this part of the state at this time of year. Going south on route 47 from Forrest to Mahomet seven flocks of starlings were noted, each flock estimated to contain at least 75 birds. An estimation of the total number of starlings seen on these two routes on this day gives over 1,300 birds. When the automobile passed the flock the birds rose in a great cloud.

On March 8 and on April 4 trips were taken over route 10 to Decatur and over route 36 to Springfield and no starlings were observed. This area is south of that upon which the large flocks were seen.

Several years ago an attempt was made to reduce the immense numbers of the purple grackle which infest the city of Urbana, and the police department shot at evening time into several flocks which were preparing to roost for the night. Several hundred were killed, but there was not a starling among them. But, curiously enough, there were many cowbirds; perhaps the flocks may have contained 15 per cent. of this species. As there were no starlings it seems evident that this species is here in sufficient numbers to flock by itself and does not mingle with the grackles as formerly.

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