

amounts in the aqueous humour of the rabbit's eye after the lens has been removed. Therefore the vitamin C of the aqueous humour arises from the lens's metabolism. Since, according to what we already know, we have to regard the aqueous humour as an ultra-filtrate of the serum, and since no iodine reducing substances are present in the trichloroacetic acid filtrate of the serum, these cannot be present in the original aqueous humour. The lens either secretes the vitamin C into the aqueous humour, or it reduces some component of the aqueous humour already present.

The vitamin C of the aqueous humour must be brought in relationship with the genesis of cataract. Within four hours after oral administration of naphthalene in doses sufficient to cause cataract, the capacity of the aqueous humour to reduce iodine disappears. I also found that the capacity of the aqueous humour-trichloroacetic acid filtrate to combine with iodine is considerably diminished in the case of cattle afflicted with cataract. The regenerated aqueous humour contains essentially less iodine reducing substances than the normal one. Medical practice shows that one can 'ripen' a young cataract by puncturing the aqueous humour. This seems to substantiate the above.

The aqueous humour, in regard to its vitamin C content, occupies a unique position, for the trichloroacetic acid filtrate of the vitreous humour can reduce only 0.5 c.c. of a *N*/500 iodine solution and that of the liquor only 0.1 c.c. per c.c.

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¹ Discussed at the meeting of the German Ophthalmological Society in 1932, by the Basel Society for Research, and at the 1933 meeting of the Swiss Physiologists in Basel.

² NATURE, 132, 27, July 1, 1933.

Vertical Distribution of Ozone in the Atmosphere

PREVIOUS estimates of the height of the ozone in the atmosphere, including our own measurements at Arosa¹, agreed in giving the centre of gravity of the ozone layer at about 40-50 km. above sea-level. These estimates were based on measurements of the intensity of the spectrum of direct sunlight as the sun was rising or setting, and—as we were careful to point out—it was necessary in deducing the height to assume that there was no regular diurnal variation in the amount of ozone through the day.

Recently it has been found possible to deduce, not only the centre of gravity of the ozone layer, but also the general character of the vertical distribution of the ozone in the atmosphere. This new method is based on observations of the spectrum of the light received from the clear blue zenith sky as the sun is rising or setting. The results of the new method are much more reliable than those of the former method, and measurements on different days give values for the average height of the ozone which agree within a few kilometres. The average height at Arosa now appears to be about 20 km., which is much below the former estimates.

The recent measurements also confirm the results obtained by an entirely different method by Götze and Ladenburg² and by Buisson³ that there is an appreciable amount of ozone in the lower layers; though the main amount seems to be situated between 15 km. and 50 km. and to be distributed in a manner

similar to that deduced theoretically by Chapman. So far as we can tell at present, the changes in the total amount of ozone which are associated with changes in the meteorological conditions seem to take place mainly in the upper region.

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¹ Götze and Dobson, *Proc. Roy. Soc., A*, 120, 252; 1928; 125, 292; 1929.

² Götze and Ladenburg, *Naturwiss.*, 19, 373; 1931.

³ Buisson, Janssevan and Rouard, *Revue d'Optique*, 12; 1933.

Salazinic Acid and the Constituents of the Lichen, *Lobaria pulmonaria*

IN the May number of the *Berichte*, p. 689, Asahina and Asano put forward a constitutional formula for salazinic acid. In the June number, p. 893, the formula is altered so as to bring it more into agreement with experimental results. With the latest formula of these workers there is an admitted difficulty in explaining the production of 3.5 dioxy-*p*-toluic acid from hyposalazinol on fusion with potash. We have been engaged on the constitution of salazinic acid for some time past, and while we confirm the empirical formula of Asahina and Asano and we had independently prepared some of the derivatives mentioned by these workers, we find a difficulty in accepting the constitutional formula submitted, as we have observed that salazinic acid on methylation with silver oxide and methyl iodide gives rise to two products, one a trimethyl derivative of salazinic acid $C_{18}H_{12}O_{10}(CH_3)_3$, and the other a pentamethyl derivative of a hydrated salazinic acid $C_{18}H_{14}O_{11}(CH_3)_5$. A full account of our experiments will appear elsewhere.

In the July number of the *Berichte*, p. 943, Asahina and co-workers state that specimens of the European species of *Sticta pulmonaria* that have been examined do not contain gyrophoric acid. On the other hand, the lichen from mid-Japan contains gyrophoric and salazinic acids and that from South Sakhalin contains gyrophoric acid and an acid having the empirical formula $C_{23}H_{34}O_5$.

In an investigation of the constitution of stictic acid we used as our raw material the lung lichen, *Sticta pulmonaria* (*Lobaria pulmonaria*, Hoffm.) gathered in the Powerscourt Demesne, Co. Wicklow, and find that no gyrophoric acid is present but it contains two constituents. One of these is a pentahydric alcohol (m.p. 102° C.; acetate m.p. 74°-75° C.) which we believe to be arabitol, and is interesting as the first recorded instance of the isolation of an alcohol of this type from a lichen. The second constituent is an acid which we had thought to be stictic acid but which does not appear to be the stictic acid of Asahina. The acid gives analytical figures (C 57.9; H 3.77; OCH_3 7.6) which agree with the formula $C_{18}H_{14}O_9$ rather than $C_{18}H_{14}O_9$. This acid with acetic anhydride and sulphuric acid gives an acetate m.p. 239° C. (C 55.4, H 4.16) which is also different from that obtained by Asahina from his stictic acid.

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