No. 84. Read the following letter from J. BROUGHTON, Esq., B.S.L., F.C.S., Government Quinologist, to the Hon. R. A. DALYELL, Acting Secretary to Government, Revenue Department, dated Ootacamund, 25th October 1873:—

In accordance with G. O., No. 714, dated 9th July 1873, Revenue Department, I have the honour to communicate the results of my investigation of the tubers of *Aconitum heterophyllum*. The Hindustani name is "Atis."

2. The examination of this native medicine was undertaken by the advice of a Bengal medical officer, who informed me that of all the febrifuge medicines employed in India, except Chinchona, this was the most effective. It has a place in the Indian Pharmacopœia, and at page 434 of that work high therapeutic value is given to it; the names of Drs. Henning, Balfour, Dymock, Moore, Forbes, Watson, and others being cited. Though the plant grows on the western Himalaya, it can be purchased in nearly all the bazaars of South India, though its use is, of course, more general in the northern Presidencies.*

* In a white febrifuge medicine employed by the Karens in British Burmah, I have detected "Atisine;" therefore, Atis is a component of the drug.

3. The appearance of the tubers is described at page 4 of the Indian Pharmacopœia. They are farinaceous, have an intensely bitter taste, and are not poisonous, being, as therein stated, free from the poisonous alkaloid aconitine.

4. After much labour, I succeeded in isolating the bitter febrifuge alkaloid, which, from its composition and properties, I find to be a new substance to which I propose to give the name "Atisine."

5. The method which I have found the most convenient for obtaining this alkaloid is as follows:—

6. The roughly powdered tubers are submitted to two exhaustions with boiling alcohol, and the resulting tincture is separated by filtration through cloth. The whole of the alcohol is then separated by distillation, and the thick extract is mixed with an equal bulk of cold water, made alkaline with caustic soda, agitated with chloroform, and allowed to settle. The whole of the atisine is then in solution in the chloroform, which is separated, the chloroform distilled off, and the atisine dissolved in dilute sulphuric acid and decolourized by animal charcoal. From this solution atisine nearly pure is precipitated as an extremely bulky white hydrate on the addition of caustic potash. In order to obtain it pure, it has to be re-dissolved in ether, again re-distilled and again dissolved in dilute hydrochloric acid precipitated by dilute ammonia and dried. The separation of atisine is neither difficult nor laborious.

7. Atisine is soluble to a considerable extent in water, to which it imparts a most intensely bitter taste. It forms a very bulky hydrate from which the water separates at a steam heat. It becomes anhydrous at 100°C. It commences to agglutinate at 76° C, and is perfectly fused at 85°. After fusion, it exactly resembles quinine in a similar state. Its alkaline properties are well marked, as it reddens moistened turmeric paper, and completely neutralizes all acids. It is soluble in carbonic disulphide and benzol. I have not succeeded in obtaining the free alkaloid in a crystalline form.

8. Its composition was determined by an analysis of its platinum double salt, which is readily precipitated from the hydrochloric acid solution of the

alkaloid by the addition of platinum tetrachloride. Without entering into details, I find the formula of atisine is $C_{40}H_{74}N_2O_4$, the truth of which I was able to corroborate by carefully conducted volumetric determination of the amount of hydrochloric acid required for neutralization. Atisine appears to have no rotatory effect on a beam of plane polarized light. Like quinine atisine is diacid. Solutions of its salts with oxygen acids are fluorescent.

9. I have obtained [illegible] in prismatic needles. The hydrochlorate is readily obtained by pouring dilute acid over a mass of the free base in the cold; crystalline crusts readily forming, which resemble quinidine hydrochlorate on examination. I have failed to obtain any other crystalline salts, though I have prepared the acetate, nitrate, and oxalate as amorphous masses.

10. A solution of an atisine salt is precipitated by tannin, mercuric chloride, potassic chromate, and ferrocyanide; also by phospho-molybdic acid and biniodide. Atisine quietly dissolves in strong sulphuric and nitric acids without any decomposition. It is a well and clearly defined alkaloid, quite new to chemists, and will very probably be of future use in medicine.

11. A further description of the chemical properties of atisine would be out of place in the present communication. I propose communicating a fuller description to the Chemical Society.

12. As the amount of atisine actually present in the tubers is but small, it would appear that this alkaloid would require to be medicinally used in very small doses. I have the honour to forward a specimen of "Atis," and one of Atisine hydrochlorate, the salt of the base most fit for therapeutical use. I would suggest that these specimens, if not otherwise required, should be presented to the Central Museum at Madras.

No. 85. ORDER THEREON, 8th December 1873, No. 1,367.

Miscellaneous.

COMMUNICATED to the Surgeons-General, British and Indian Medical Departments, to whom a specimen of Atisine hydrochlorate should also be sent by the Government Quinologist.

2. The specimen forwarded will be sent to the Museum as suggested.

3. Mr. Broughton is thanked for his report, copy of which will be forwarded to the Secretary of State and Government of India.

(True Extract.)

(Signed) D. F. CARMICHAEL,
Secretary to Government.

To the Surgeon-General, British Medical Department.
" " Indian Medical Department.
" the Government Quinologist.
" the Superintendent Government Museum.
" the Commissioner of Nilgiris.

Exd. W. H. French.

Revenue Department.

No. 1367

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 8 December 1873.

Read the following Letter from the Government Botanist.

Regarding chemical investigation of the native febrifuge "Atis"

} dated 25th October 1873

Communicated to the Surgeons-General and Director-General of Indian Medical Department for information.

The attention of the Government Quinologist is also directed to the subject.

Ordered, that a copy of the above letter be forwarded for the information of the Government of India.

Copy of article will be for-
warded to the Secretary of
State and Government of
India.

No. 4.

6 Surgeon-Genl British Mess. Depot
6 Surgeon-Genl Ind. Mess. Depot
1 Genl Quartermaster
2 Supt Genl Museum
3 Comm. Refugees

Dec. 18 Dec. 73

Govt. of India Madras.

REVENUE.

[illegible]

Dated [illegible]

Read [illegible]

[illegible] Read 23rd Dec 1878. No. 1357

[illegible]

[illegible]