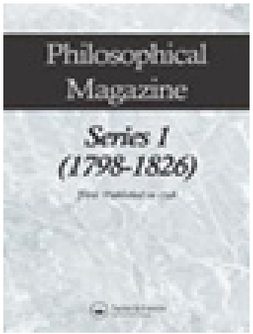

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XVII. Biographical memoirs of M. de Saussure

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Obſervation.

The hydro-azote is made by burning æther under a bell-glaſs, when the oxygen unites with the hydrogen and forms water, and the reſidue is azotic air; a ſpecies of heavy, inflammable, or hydrogen air, and ſome æther in the ſtate of vapour, and a ſmall proportion of fixed air. I have myſelf inhaled ten quarts of this pure, and the pulſe has ſunk from eighty to ſeventy beats in a minute, and continued ſo for a quarter of an hour or more. It is very grateful to the lungs; and I flatter myſelf, that this new ſpecies of air, firſt employed by me, may prove hereafter a valuable acquiſition to the *ars medendi*. As we brace the conſtitution with tonic medicines, thereis danger of local inflammation, which this appears to obviate; or, has the hydro-azote any peculiar healing quality?

XVII. *Biographical Memoirs of M. de* SAUSSURE. *By A. P.* DECANDOLLE †.

HORACE BENEDICT DE SAUSSURE was born at Geneva in 1740. His father, an intelligent farmer, to whom we are indebted for ſome memoirs relating to rural economy, reſided at Conches, a place ſituated on the banks of the Arve, at the diſtance of half a league from Geneva; and this country life, added to an active education, expanded no doubt in young De Sauſſure that phyſical ſtrength ſo neceſſary to the naturaliſt who devotes himſelf to travel. He repaired daily to town to enjoy the advantage of public inſtruction; and as he lived at the bottom of Saleve, a mountain which he has ſince rendered celebrated, he amuſed himſelf frequently with aſcending its ſteep and rugged ſides. Being thus ſurrounded by the phenomena of nature, and at the ſame time aided by ſtudy, he conceived a taſte for natural hiſtory, and avoided the error both of the learned, who form theories without

† From *Decade Philoſophique*, No. XV.

having

having been out of their cloſets, and of thoſe farmers who, living too near to nature, are incapable of admiring her beauties.

His earlieſt paſſion was botany: a variegated ſoil, abundant in plants of different kinds, invites the inhabitant of the banks of the Leman to cultivate that agreeable ſcience. This taſte produced an intimacy between De Sauſſure and the great Haller. He paid him a viſit in the year 1764, during his retreat to Bex; and he relates in his travels how much he admired that aſtoniſhing man, who excelled in every part of the natural ſciences. De Sauſſure was induced alſo to ſtudy the vegetable kingdom, by his connexion with Ch. Bonnet, who had married his aunt, and who ſoon ſet a juſt value on the riſing talents of his nephew. Bonnet was then employed on the leaves of plants. De Sauſſure ſtudied theſe organs of vegetables alſo, and he publiſhed the reſult of his reſearches, under the title of *Obſervations on the bark of leaves*. This ſmall work, which appeared ſoon after the year 1760, contains new obſervations on the epidermis of leaves, and in particular on the miliary glands by which they are covered *.

About that period the place of profeſſor of philoſophy falling vacant, it was conferred upon De Sauſſure, who was then only twenty-one years of age. Experience proves, that if premature rewards extinguiſh the zeal of thoſe who labour merely for themſelves, they, on the contrary, ſtrengthen it in thoſe who labour only for truth. At that time the two profeſſors of philoſophy at Geneva taught phyſics and logic alternately. De Sauſſure diſcharged this double taſk with equal ſucceſs. He gave to his courſe of logic a practical, and, as one may ſay, experimental turn; and his method of teaching, which began by ſtudying the ſenſes to arrive at the general laws of the underſtanding, announced already an able obſerver of nature.

Phyſics however were the part for which he had the greateſt taſte, and which conducted him to the ſtudy of chemiſtry

* He had reſumed this ſubject eighteen months before his death.

and mineralogy. He then began his travels through the mountains; not now to examine their vegetable productions, but to ſtudy the mountains themſelves, either in the ſtones of which they are compoſed, or the diſpoſition of their maſſes. Geology, a ſcience which was then ſcarcely in exiſtence, added charms to his numerous excurſions through the Alps; and it was then that the talents of the great philoſopher were really diſplayed. During the firſt fifteen or twenty years of his profeſſorſhip, he employed himſelf by turns in diſcharging the duties of his office, and in traverſing the different mountains in the neighbourhood of Geneva. He even extended his excurſions on one ſide as far as the banks of the Rhine, and on the other to Piedmont. At the ſame time he undertook a journey to Auvergne to examine there the extinguiſhed volcanoes, and another to Paris, England, and Holland. After that he viſited Italy, and even Sicily. Theſe were not mere journeys for the purpoſe of reaching any particular place. He undertook them only with a view of ſtudying nature; never travelled but ſurrounded by every inſtrument that could be of uſe to him, and never ſet out until he had drawn up a plan of the experiments and obſervations he intended to make. He often ſays in his works, that he had found this method exceedingly uſeful.

In the year 1779 he publiſhed the firſt volume of his *Travels through the Alps*, which contains a minute deſcription of the environs of Geneva, and an excurſion as far as Chamouni, a village at the bottom of Mont-Blanc. Philoſophers will read there with pleaſure the deſcription of his *magnetometer*. The more he examined mountains, the more was he ſenſible of the importance of mineralogy. To ſtudy it with advantage, he learned the German language; and it may be ſeen, in the laſt volumes of his Travels, how much new mineralogical knowledge he had acquired.

Amidſt his numerous excurſions through the Alps, and at the time of the political troubles of Geneva in 1782, he found means to make his beautiful experiments on hygrometry, which

which he publiſhed in 1783 under the title of *Eſſays on Hygrometry*. This work, the beſt that ever came from his pen, eſtabliſhed fully his reputation as a philoſopher. We are indebted to him alſo for the invention of a new hygrometer. Deluc had already invented his whalebone hygrometer; and on that account there aroſe between him and De Sauſſure a ſort of conteſt, which degenerated into a pretty violent diſpute.

In the year 1786 De Sauſſure reſigned the profeſſor's chair, which he had filled for about twenty-five years, to his pupil and fellow-labourer Pictet, who diſcharged with reputation the duties of an office rendered more difficult by ſucceeding ſo eminent a philoſopher.

When De Sauſſure was invited by the ſtate to take a ſhare in the public education, he made it one of the ſubjects of his meditations, and preſented the plan of a reform in the education of Geneva, the tendency of which was, to make young people early acquainted with the natural ſciences and mathematics. He even wiſhed that their phyſical education ſhould not be neglected, and with that view propoſed gymnaſtic exerciſes. This plan, which excited much attention in a city where every one is convinced of the importance of education, found admirers and partiſans; but the poverty of its pecuniary reſources was an obſtacle to every important innovation. It was beſides feared that, by altering eſtabliſhed forms, they might loſe the ſubſtance, and that things might be changed for the worſe. The Geneveſe were attached to their old ſyſtem of education; and they had reaſon to be ſo, becauſe it had not only proved the means of diffuſing knowledge generally amongſt them, but had called forth the talents of ſeveral eminent mathematicians* and philoſophers†.

But De Sauſſure's attention was not confined to public edu-

* Abauzit, Cramer, Lhuilier, J. Trembley, &c.

† Jalabert, A. Trembley, Bonnet, Leſage, Deluc, Senebier, Prévoſt, Pictet, and De Sauſſure himſelf.

cation alone. He ſuperintended himſelf the education of his two ſons and a daughter, who have ſhewn themſelves worthy of ſuch an inſtructor. His daughter to the charms of her ſex unites an extenſive knowledge of the natural ſciences; and his eldeſt ſon has already made himſelf known by his phyſical and chemical labours.

The ſecond volume of his Travels was publiſhed in 1786. It contains a deſcription of the Alps around Mont-Blanc, which the author conſiders as a mineralogiſt, a geologiſt, and a philoſopher. He gives alſo ſome intereſting experiments on electricity, and a deſcription of his electrometer, the moſt perfect we have. We are indebted to him alſo for ſeveral inſtruments of meaſurement, ſuch as his *cyanometer*, deſtined to meaſure the degree of the blueneſs of the heavens, which varies according to the elevation of the obſerver: his *diaphanometer*, or inſtrument for meaſuring the tranſparency of the atmoſphere; and his *anemometer*, which, by means of a kind of balance, weighs the force of the wind.

Some years after the publication of the ſecond volume of his Travels, De Sauſſure was admitted as a foreign aſſociate of the Academy of Sciences of Paris; and Geneva could then boaſt of having two of its citizens in that claſs, which conſiſted only of ſeven members. De Sauſſure not only did honour to his country: he loved and ſerved it. He was the founder of the Society of Arts, to which Geneva is indebted for the high ſtate of proſperity it has attained within the laſt thirty years. He preſided over that ſociety till the laſt moment of his life, and one of his fondeſt wiſhes was the preſervation of this uſeful eſtabliſhment.

In conſequence of M. de Sauſſure's fatiguing labours in the Council of Two Hundred, of which he was a member, and afterwards in the National Aſſembly, his health began to be deranged, and in 1794 he was almoſt deprived of the total uſe of his limbs by a ſtroke of the palſy. However painful his condition then might be, his mind ſtill preſerved its activity;

activity; and after that accident he reviſed the two laſt volumes of his Travels, which appeared in 1796. They contain an account of his excurſions to the mountains of Piedmont and Swiſſerland, and in particular of his journey to the ſummit of Mont-Blanc. Theſe volumes, inſtead of exhibiting any marks of his malady, preſent an enormous maſs of new facts and obſervations of the utmoſt importance to phyſics.

He rendered alſo an important ſervice to that ſcience by publiſhing the *Agenda**, which terminate his fourth volume, and in which that great man, ſurviving himſelf, conducts the young naturaliſt through the middle of mountains, and teaches him the method of obſerving them with advantage. Theſe *Agenda* are a proof of his genius, and of the ſtrength of mind which he retained amidſt his ſufferings. It was alſo during his illneſs that he publiſhed *Obſervations on the fuſibility of ſtones by the blow-pipe*, and that he directed the experiments made on the height of the bed of the Arve*. Having gone for the ſake of his health to the baths of Plombiers, he ſtill obſerved the mountains at a diſtance, and cauſed to be brought to him ſpecimens of the ſtrata which he perceived in the ſteepeſt rocks. He had announced that he would conclude his Travels with ſome ideas on the primitive ſtate of the earth; but the more he acquired new facts, and the more he meditated on the ſubject, the more uncertain did his opinions become in regard to thoſe grand revolutions which preceded the preſent epoch. In general he was a Neptunian; that is to ſay, aſcribed all the revolutions of our globe to water. He admitted the poſſibility of the mountains having been thrown up by elaſtic fluids diſengaged from the cavities of the earth.

Though the ſtate of his health began gradually to become

* Part of theſe *Agenda* have been already given in the *Philoſophical Magazine*: the reſt will be given in the ſubſequent numbers. EDIT.

* His memoirs on theſe ſubjects were inſerted in the *Journal de Phyſique*.

worſe, he ſtill entertained hopes of recovery; and the French government having appointed him profeſſor of philoſophy at the Special School of Paris, he did not deſpair of being one day able to fill that office: but his ſtrength was exhauſted, a general languor ſucceeded the vigour he had always enjoyed, his ſlow and embarraſſed pronunciation no longer correſponded with the vivacity of his mind, and formed a melancholy contraſt with the pleaſantneſs by which he had been formerly diſtinguiſhed. It was a painful ſpectacle to ſee this great man reduced thus to imbecility at an age when meditation is beneficial, and when he ought at leaſt to have enjoyed the fruits of his reputation and labours.

In vain did he try, for the re-eſtabliſhment of his health, all the remedies which medicine enlightened by the phyſical ſciences could afford—all aſſiſtance was uſeleſs. The vital power quitted him with ſlow and painful ſteps. Towards the beginning of autumn laſt year his decay became more viſible, his mind loſt all its activity, and on the 22d of March 1799 he terminated his brilliant career, at the age of 59, lamented by a family to whom he was dear—by a country to which he had done honour—and by Europe, the knowledge of which he had extended.

XVIII. *Letter from Dr.* CARMICHAEL SMYTH *to the Editor of the Philoſophical Magazine.*

SIR,

OBSERVING in your Magazine of laſt month an article in which Mr. Cruickſhank has corrected a miſtake I had fallen into in relating an experiment of his on variolous matter; I have only to ſay, that had this gentleman informed me of this circumſtance, I certainly would have ſaved him the trouble he has taken. As for the way in which the miſtake originated, although it could be eaſily explained; yet, as the recollection of this gentleman and of his friend