THE TAIL OF COMET BROOKS (c. 1893).—The tail of this comet seems to have undergone some interesting changes, and the following brief descriptions from two well-known observers will show the different appearances observed. Mr. Brooks describes the tail on October 21, 17h, as having a sharp curve close to the head towards the south and accompanied by a faint secondary tail, issuing from the head at an angle of 30° to the main tail towards the north (*Astronomy and Astrophysics* for December). On November 4, the tail assumed its usual straight form, but on November 9, 17h, it was straight for a length of half a degree from the head, where it became forked, the larger portion curving gracefully to the south, the fainter part straight, or nearly so, branching to the north, the two branches making an angle with each other of about 25°. Prof. Barnard, who has obtained several pictures, found that they showed undoubtedly that on October 21 the tail had encountered some outside or obstructive medium which badly shattered it. Rapid and some very remarkable changes in position angle were also gathered from an examination of the plates. The advantage of photography for obtaining cometary photographs, and especially for making analyses of the tails, will be at once grasped when one considers that Prof. Barnard, with the 12 in., could not trace the tail even to a distance of 1°, while the photographs taken with the Willard lens (6 in. aperture, 31 in. focus) showed it fully for 10°.

HYDROGEN ENVELOPE OF THE STAR D.M. +30°3639.—Prof. W. W. Campbell, in the December number of *Astronomy and Astrophysics*, communicates a very important observation with regard to the spectrum of one of the Wolf-Rayet stars. The star in question is of the 9·3 magnitude, D.M. +30°3639, and its spectrum is very rich in bright lines. The most striking features of the visual spectrum have been noted as the bright line λ 5694, the bright blue band at λ 4652, and the very bright hydrogen line Hβ. By arranging the spectroscope so that each of these different parts of the spectrum is in focus, the line λ 5694 is seen as "a very small image of the star." The band at λ 4652 is "broad and lies wholly upon the narrow continuous spectrum," the Hβ line observed with a narrow slit "is a long line extending to a very appreciable distance on each side of the continuous spectrum," and with an open slit is "a large circular disc 5″ in diameter." Other hydrogen lines Hγ and Hα also exhibit the same peculiarities. The explanation of this appearance is that the star in question must be surrounded by an envelope of incandescent hydrogen, for other lines in the same spectrum are not so changed. It is remarked also that in other stars of the same type no such image has been observed.

"L'ASTRONOMIE" FOR DECEMBER.—The December number of this journal commences with a most interesting article by Dr. Janssen on the Observatory at Mont Blanc. The article itself contains nothing of which our readers have not been informed in the previous columns of NATURE unless it be the illustration showing the summit of the mountain with the observatory "in winter." Two good illustrations of the appearance of the sun during the last total eclipse of the sun (April 16, 1893), the clichés of which were obtained by M. Schœberle and Prof. Deslandres. "Around the world of Jupiter in ten hours" is the title of a series of observations made at the observatory of Juvisy by M. Eugène Antoniadi. The writer gives twelve drawings of this planet, as made during this period, showing the various surface markings which were brought to view by rotation. Amateurs and others who at this time are observing this planet will find these drawings a most useful help in recognising many markings. The red spot is described as excessively pale: "Elle est colorée en rose; ses regions centrales sont claires, ses bords plus sombres; elle est entourée d'une auréole blanchâtre."

GEOGRAPHICAL NOTES.

THE death of Dr. H. Rink, on December 15, removes the greatest authority on Greenland and the Eskimo. His life-long devotion to the problems of the Arctic people gained for him the esteem of all geographers.

REUTER'S AGENCY announces that information has been received from Baron Toll to the effect that up to October 25 Dr. Nansen had not called at the Olenek river. This is practically decisive news that Dr. Nansen found the sea so open that he determined to push northward without delaying to call anywhere; and it is improbable that we shall hear more of the intrepid traveller until we receive his own report of success or failure.

DR. MURRAY'S paper on the renewal of Antarctic exploration will be published in the January number of the *Geographical Journal*, which commences the third volume. It will be accompanied by a series of letters from distinguished foreign oceanographers and naturalists, strongly urging the importance of resuming systematic exploration in Antarctic seas.

DR. HILLIER has recently communicated a paper to the Vienna Academy of Sciences on the geography of the Pindus range, one of the few mountain systems of any extent in Europe which has never yet been adequately explored. He finds that the system consists of three parallel ranges, and he has unravelled the geological structure of each.

A COMMUNICATION to the Royal Geographical Society states that Mr. Crawshay, a Government official in British Central Africa, has recently visited the Angoni country near Lake Nyasa. He found the Nyika Plateau, which was traversed on the way, a magnificent country, inhabited by a scattered population of Anyika, living in huts built on narrow terraces on the mountain-side or in caves, and cultivating peas as an almost exclusive crop. In this district there are some fine mountains, exceeding 8,000 feet in height, the principal town of the Anyika, on the slope of Kantorongondo, being nearly 6,000 feet above the sea.

EPIDEMIC INFLUENZA.[1]

THE present report, a welcome supplement to the epoch-making report on the epidemic of 1889-90, is divided into eight parts, the first seven by Dr. Parsons, and the last one by Dr. Klein. It includes statistical studies of the epidemic of 1890, an account of the recent epidemics in England and Wales, a history of influenza abroad in 1891 and 1892, considerations respecting the ætiology of the disease, notes on some clinical features of the later epidemics, reports on outbreaks in institutions, &c., remarks on the prophylaxis of the disease, and, in Dr. Klein's department, a report on influenza in its clinical and pathological aspects, to which photographic plates are appended exhibiting influenza bacilli.

Among the conclusions confirmed by the present report are the small influence of locality, or environment, and the invariably potent factors of exposure or proximity to the sick, and bad ventilation. Over and over again serious epidemics in a town or island have been traced to the arrival of one or two persons from an infected place. With regard to the later epidemics, it would appear that the contagion of the disease, scattered broadcast, had "retained its vitality, but in a suspended or inconspicuous form, perhaps by transmission from one human being to another in a succession of mild sporadic cases, perhaps in some medium external to the human body." Recrudesence has taken place chiefly in early spring and in autumn. Observers in various parts of the world have contributed their experience that the progress of influenza in a country is gradual. The most remarkable instances of rapid and wide diffusion were in the United States, especially in the Western States and to settlements far apart.

A good example of the usual manner of spread is given in Part IV. A teacher of music visited two relatives ill with influenza on April 6, and returned to his own locality, which had been hitherto unaffected. On April 9 he was attacked, but struggled through his work, and gave lessons to pupils at several houses. On April 11, ten of his pupils, and on April 12, the people with whom he lodged, developed the disease.

One medical officer states that he recollects no instance of the disease spreading from one member of a household to others where strict precautions for isolation and disinfection were taken. Unfortunately, however, it often happens that the first member attacked was not the only one who had been previously exposed to infection. Dr. Newsholme, medical officer for Brighton, states that the borough sanatorium, being very strictly isolated in every respect, escaped during the first two outbreaks, and in the third until a servant who had been absent

[1] Further report and papers on Epidemic Influenza, 1889-92. With an introduction by the Medical Officer of the Local Government Board. 1893.

returned and fell ill with influenza; strict isolation was even then successful in preventing its spread to the inmates.

Dr. Caldwell Smith's evidence as to ætiology is valuable and interesting. "It is to the life history of Pfeiffer's bacillus that we must direct our attention if we wish to understand the seemingly strange vagaries of the disease. An individual is infected by breathing at once the expired air from a person suffering from the disease, and I believe this to be the only method of infection."

The concourse of people is favourable to the spread of influenza in two ways, according to Dr. Parsons: firstly, by bringing the affected and the healthy near together; and secondly, by the poison being present in a more concentrated form in confined and vitiated air.

Among the discussions which throw light on the character of the disease, and bear upon the means of prevention, the following may be mentioned: on the degree of protection afforded to individuals and to communities by previous attacks, on the influence of occupation and of unsanitary conditions, on the connection with pneumonia, on the period of infectiousness, on the clinical features of the later epidemics, and on relapses.

The researches of Dr. Klein, in respect to the effect of inoculation upon animals, gave results for the most part negative. His affirmative results, however, were "in full agreement with the results obtained by Pfeiffer and Kitasato." The bacillus was always abundantly present in the bronchial secretion of patients suffering from influenza, diminishing in number as the disease abated.

"It is to be feared," wrote Dr. Parsons, "that the contagion of influenza is still domiciled among us, and that a renewal of its epidemic activity within the next few years is by no means improbable." The expected revival is now only too apparent. A certain proverb declares, with the rashness of its class, that the man once bit is twice shy. In a literal sense, the saying may contain a good deal of truth, but to nations, or aggregations of individuals, it is quite inapplicable. The development of common sense for common action against these evils has still to take place. This country has now passed through three severe epidemics of influenza within four years, each outbreak drawing many sad maladies in its train, prostrating hundreds of thousands of breadwinners, cutting short many illustrious lives, and crippling many for years to come, and we are now running into a fourth epidemic in London, without any great organised attempt being made to counteract it.

The provisional memorandum of the Local Government Board, issued on January 23, 1892, impressed upon the public the fact that in its epidemic form influenza is an eminently infectious complaint, communicable in the ordinary personal relations of individuals with each other, that separation of the sick from the healthy should as far as practicable be carried out, that rooms, &c. should be disinfected, and that ventilation should receive special attention.

It would be some defence against a serious recrudescence of the pest if this memorandum, or an abstract of it, were supplied to every householder on the first threatenings of an outbreak in any locality. In his article on prophylaxis, Dr. Parsons remarks on the difficulties which would frustrate any measures of notification and isolation on a large scale, but suggests that notification, with fees for early cases only, might be tried in certain districts, and that such a measure should be adopted "in the interval before another epidemic." So much experience has been gained in distinguishing the symptoms of influenza from those of other ailments, that the difficulty of diagnosis cannot now be an insuperable bar to attempts at prevention. It is well to remember that the pecuniary cost of prevention cannot be compared with the loss to the country by an epidemic, for this has been proved to amount to millions.

Among places and means of infection which may cause much mischief, but are not noticed in this volume, are bakers' shops, in which the baker or attendant suffers from influenza or severe cold; booking offices, post offices, banks, &c. in which the mouth and the ledger, &c. are in multiple communication; letters written and fastened by patients; and, most of all, railway carriages packed full and with windows closed, daily conveying vast numbers of people to and from the city, and containing perhaps the most organically polluted air which can easily be found in a civilised country.

The report closes with an interesting statement respecting the immunity of animals, including monkeys, at the Zoological Gardens.

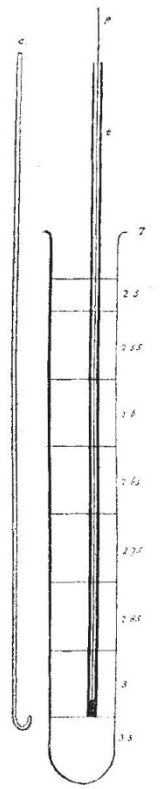
R. RUSSELL.

ON A METHOD OF SEPARATING THE MINERAL COMPONENTS OF A ROCK.

IT is told of a famous German petrographer, that whenever appealed to by a student in difficulties over a problematical mineral in a rock-slice, his invariable advice was "Get it out."

It is hard dispassionately to reflect on the sufferings to which this simple process of "getting it out" have given rise. All we petrographers have passed through the vale! May we now indulge the pious hope that the following simple apparatus may bring some mitigation to the ordeal? It will certainly save a good deal of time and trouble when only small quantities of a particular mineral are required; enough, that is, for a blow-pipe analysis, a flame test, and microscopical examination.

A large test-tube (see Fig.), conveniently six inches in length by three-quarters in diameter, is filled with heavy solution, graded from specific gravity 3·3 to 2·5, so as to form after standing a diffusion column, as already described in NATURE, vol. xliii. p. 404, 1891. It is not necessary to wait till the change in density of the column is uniform from top to bottom; by introducing a sufficient number of specific gravity indexes the column is mapped out into a succession of lengths, within the limits of each of which the change of density is practically uniform, certainly sufficiently so for mineral determinations.



A test-tube containing a diffusion column. The figures at the side indicate corresponding specific gravities: *t*, pipette fitted with a piston *p*; *c*, crook by which the lower end of the pipette may be plugged.

A fragment of the rock to be examined, about the size of a hazel-nut, is powdered in the usual way, sifted and washed, dried and then introduced into the diffusion column. Separation of the constituent minerals at once begins to take place, and in the course of a few hours is complete. Each species of mineral is then floating in liquid of its own specific gravity; the next problem is to get it out. A pipette as commonly used is not sufficient, for as it is introduced grains of minerals from other zones than that sought for, adhere to its sides; on removing the finger, the sudden inrush of fluid carries with it grains from surrounding zones, and finally on drawing up the pipette, fluids of zones lying above that to which it has descended displace the heavier fluid it already contains, carrying with them suspended grains, and thus bringing about the mixture which it is our desire to prevent.

With very little trouble these difficulties may be completely overcome. To prevent the sudden inrush of fluid the pipette, which should be of small calibre (in my experiments it measures 1·5mm.), is fitted with a piston (*p*). This may be very simply made by winding a little unravelled cotton thread round the end of a stem of Esparto grass, such as is sold for cleaning tobacco-pipes. The piston is pushed down to the bottom of the pipette, which is then ready for use.

To extract grains from any zone the pipette is slid down into the diffusion column till its lower end is just immersed in the zone; a gentle shake given to it as it passes through the solution will serve to detach adhering particles; the piston is then slowly raised, and the fluid with its floating mineral grains quietly follows it, the other zones remaining undisturbed. To prevent the fluid of higher zones entering the pipette as it is withdrawn, it is necessary to plug its lower end; no very tight closure is necessary, since the piston, which now lies at the upper end of the pipette, by excluding the air ensures the retention of the contained column of fluid; all that is needed is a stopper, which will exclude solid particles. A very thin glass rod is rounded off at one end, which is then bent upwards into the form of a crook (*c*). The crook is let down into the diffusion column till its upward pointing lower end lies beneath the open extremity of the pipette, which it completely blocks up on being