8. The cells of Langerhans are only nerve-cells, either belonging to the ganglia (Merkel's) or to the subepidermic plexus, which have also been dragged into the epidermis, and broken off there.

9. Taking the ordinary hair-nerve apparatus as a standard, we find that its elements may hypertrophy, as shown in the feeler-hairs; or atrophy, as shown in the organ of Eimer in the mole, and in the touch bodies and Pacinian bodies.

10. The organ of Eimer represents the nerve-apparatus of a hair-follicle, from which the hairs have been, in former generations, dragged out by the action of the digging hands of the mole.

11. The forked tactile elements of the aborted hair-follicle may become transformed into Pacinian bodies, which are indeed their homologues and are true tactile nerve-endings.

ON THE VAPORISATION OF CHLOROFORM, ETHER, AND ETHYL-BROMIDE AT DIFFERENT TEMPERATURES.

By WILLIAM SQUIRE, M.D., F.R.C.P.

HAVING recently had occasion to use Dr. Junker's anæsthetic apparatus, my attention was directed to a table of the varying amounts of chloroform and of ether vapourised while passing the same quantity of air through diminishing quantities of the anæsthetic fluid. This table, prepared by Mr. Krohne, gives the results of passing about 430 cubic inches of air through the liquid experimented with, by 100 compressions of the elastic bellows used. It is, shortly, as follows:

Temperature of Air, 65° Fahr.			
Chloroform.	Methylene.	Ether.	
6 drachms 110 minims	80 minims	215 minims.	
4 " 90 "	50 "	180 "	
2 " 50 "	30 "	95 "	

In this table, the temperature is given at the commencement of the experiments, but no note is taken of the reduction of temperature, towards the end, produced by the evaporation.

This reduction is considerable; it is greatest in the more readily vaporisable liquid. Each fluid varies as to the amount of vapour given off at different temperatures, and it is to this, rather than to the amount of liquid used, or its height in the containing vessel, that the variations in the table given are mainly due. Bromic ether gives off a very equable amount of vapour at a temperature of 70°. Anhydric ether comes off in moderate quantity at 40°. Chloroform should be lowered to 50° before using.

If, instead of commencing at 65°, with six drachms of chloroform, the temperature be reduced to 50°, not 110 minims, but 80 minims are carried off in vapour by 100 compressions of the bellows, unless a considerable interval be allowed, so that the loss of temperature produced in the first two minutes may be regained. By using the bellows twenty-five times every two minutes, and noting the loss at these intervals, 30 minims were carried off in the first two minutes, 25 minims in the second, fifteen in the third, and only 10 in the fourth, when the temperature was reduced 5°. Commencing at 55°, with only five drachms of chloroform, and using the bellows still more slowly, the loss was 45 minims in the first 25 compressions of the bellows, 30 minims in the second, 20 in the third, and 15 in the fourth. The height of the column of chloroform was one inch to half an ounce; it, consequently, was an inch and a half at the commencement of the observation, and less than one inch at the close; that is, higher when only 15 minims were carried off in the first experiment, than when 45 minims were lost at the beginning of the second with a higher temperature. In a smaller tube, holding two drachms of chloroform at 55° in an inch and half of height, the same sequence of compressions, forcing 100 cubic inches of air through in two minutes, removed 30 minims in the first, and 20 in the second series, when the temperature fell to 47°; again 20 in the third and 15 in the fourth, when the temperature fell from 45° to 43°. Hence I conclude that it would be well in administering chloroform by Dr. Junker's apparatus, to lower the temperature at the commencement to 50° Fahr., and to slightly warm the receptacle afterwards by holding it in the hand, or placing it inside the coat. For bromic ether, some means of maintaining a temperature of 60° is advisable. Bichloride of methylene seems to vaporise slowly at this temperature, and, consequently, does not rapidly cool; it is, therefore, specially suitable for inhalation by Junker's method. Alcohol, in this way, vaporises slowly and equally without much cooling.

The rapid cooling of ether has hitherto been an obstacle to its ready administration by Dr. Junker's instrument. Mr. Krohne has, to some extent, obviated the difficulty by enlarging the receptacle. By this means I have produced complete anæsthesia in two and a half minutes,

which lasted three minutes. Half an ounce of ether had disappeared in 48 inspirations, and the temperature of what remained was reduced 10°, or to 50° Fahr. The temperature of the room and of the ether, to begin with, was 60°. The vapour given off at first was too strong to be agreeable. Even with a good allowance for air entering by the side of the mouthpiece, some cough was excited, and some excess of vapour escaped into the room. In a second administration, beginning with the ether at 54°, sufficient vapour to produce unconsciousness in less than two minutes was liberated without exciting cough. Twelve inspirations were taken in the first minute, 20 in the next 50 seconds. The anæsthesia could have been maintained with very little ether vapour if more had been needed. The temperature of the ether was again lowered to 40° or ten degrees in less than fifty compressions of the bellows. Further observations seem to indicate that the receptacle for ether need not be much enlarged in order to make Junker's apparatus as available for this as for chloroform. Lowering the temperature at first, as by spraying ether on it externally before using, and warming it afterwards by the hand or a warm cloth, would be all that is needed to adopt this safe and convenient method of inhalation to both the anæsthetic ethers.

Table of Evaporation of Ether at Lowered Temperatures.

Amount of Fluid.	Height of Column.	Temperature of Fluid.	Cubic Inchs. of Air.	Fluid Evaporated.	Temprtre. After.
4 drachms	3 inches	60°	100	90 minims	55°
3 " "	2½ " "	55°	100	80 " "	50°
2 " "	1½ " "	50°	100	60 " "	45°
1½ " "	1¼ " "	45°	100	40 " "	36°
Second Experiment.					
5 drachms	3½ inches	55°	100	90 minims	47°
3½ " "	2½ " "	45°	100	60 " "	40°
2½ " "	2 " "	35°	100	40 " "	34°
2 " "	1½ " "	30°	100	30 " "	28°

On evaporating another half drachm, the ether froze in the tube. Two minutes were occupied in the 25 compressions of the bellows, transmitting 100 cubic inches of air. A pause of one minute was made between each series of compressions. In the first observation ether was added at each pause, and in the second the tube was not opened, and no addition made.

Table of Evaporation of Bromic Ether at Lowered Temperatures.

Amount of Fluid.	Height of Column.	Temperature of Fluid.	Cubic Inchs. of Air.	Fluid Evaporated.	Temprtre. After.
5 drachms	3½ inches	50°	106	60 minims	48°
4 " "	2½ " "	47°	100	35 " "	42°
3½ " "	2½ " "	40°	100	30 " "	36°
3¼ " "	2¼ " "	35°	100	25 " "	33°
2¾ " "		32°		Freezing.	

Freezing of some of the ether in the tube was produced, when two drachms and a half only were left, by 100 more rapid actions of the bellows in another experiment with a loss of 90 minims of ether, while the temperature of the fluid remained at 32°. With the slower compressions at the ordinary rate of respiration, 150 minims were vaporised. It will be seen how much more equable is the evaporation of bromic ether than of anhydrous ether by this method.

Clover's ether-inhaler is well suited for the administration of bromic ether. The outer metal case should be warmed up to 70° in cold weather. Instead of water, a layer of felt within this case would retain the heat longer. The proportion of vapour for ether and bromic ether that can be easily inhaled is about the same; viz., 50 minims to 100 cubic inches of air. Fifty minims are equal to more than 100 drops of bromic ether. With ether at ordinary temperature, much more than this amount of vapour is given off; so that, at the commencement of inhalation, the valve of the mouthpiece must be fully open, and much air also admitted at the sides; therefore the temperature of the receptacle may require to be artificially lowered, at first, for ordinary ether.

FEVER IN CARLOW.—A good deal of typhoid fever has occurred during the last few months in Carlow, and also a continued fever with marked diarrhoea. Suspicion was attracted to the water-supply of the town, and an investigation has proved that, at least in some of the streets, it is polluted with sewage. There is little doubt but that the water-supply is subject to periodical pollution by sewage, and the town commissioners, whose attention has been directed to the subject, do not appear to attach sufficient importance to the absolute necessity of a good supply of water for their town.