they are expected to learn, and probably do learn, all that the officers acquire in the eight days which is allowed them for practice in meteorology. When it is remembered that the sole occupation of the great majority of these men, during the entire period of their enlistment after leaving Fort Myer, is to make and record meteorological observations, it seems little short of folly to subject them to such a course of training in preparation. That only ten days, out of the one hundred and eighty spent in the school, should be occupied in practical training in observation, and the use of instruments, is certainly an inversion of the true order of things. It is difficult to see the value, to such men, of the long training in 'cavalry tactics,' the 'manual of the carbine,' the 'manual of the kit,'— whatever that may be, — and many other things found in the course. It is true, that, to observers stationed on the seacoast, a knowledge of naval signals is necessary; and, to all, a degree of familiarity with the practical working of the electric telegraph would be desirable: but the business of the great majority of the observers is purely scientific, and, it is to be hoped, peaceful in its character. It is clear that the skill and knowledge necessary to the successful performance of these duties must be largely acquired after active service has begun.

The chief signal-officer very properly remarks, that the criticism to which the service has been subjected is evidence of its success. No well-informed person can fail to feel great pride in the results achieved by the signal-service since the organization of the weather-bureau. The general increase in the accuracy of its forecasts, the efforts made to communicate important meteorological information to localities likely to be seriously affected by probable changes in the weather, and its valuable services in the display of cautionary and danger signals, have given it a hold upon the confidence of the people not easily weakened.

The percentages of verification of predictions since the organization of the weather-service, as given in the various reports, are as follows:

Year.	Per cent of verification.	Year.	Per cent of verification.
1871	69	1877	86
1872	77	1878	84
1873	77	1879	86
1874	84	1880	86
1875	87	1881	85
1876	–		

In the display of cautionary and danger signals, the success has been about equally great. In forecasting, in which the character of the weather only is considered, the percentage of verification is generally as high as ninety.

While these figures do not indicate any marked progress during the past five years, it must be remembered that a point has been reached from which farther advance must necessarily be difficult and slow.

'REX MAGNUS.'

AT the suggestion of the editors of SCIENCE, I have carefully examined the 'viandine' brand of the new preservative 'Rex magnus,' and find it contains boracic acid, sodium, potassium, and water as ingredients; and I believe its composition can be roughly formulated as follows: —

Boracic acid, Borax	67	per cent.
Potassic chloride	15	"
Water	18	"

The mixture also contains very small amounts of sulphur and magnesium. Both, however, are probably accidental impurities.

To determine the preservative properties of the viandine brand, a number of experiments were undertaken, the general result of which can best be shown by copying some of the notes taken during the course of the experiments, and supplementing them with a formulated table.

July 5, I dissolved one-half pound of viandine in one gallon of water contained in a stone jar, and placed one pound of beef-steak, one pound of veal-steak, and one pound of fresh mackerel in the solution.

July 6, the beef, veal, and fish, which had remained in the solution twenty-six hours, were removed, and, after allowing them to drain for two or three minutes, were placed on plates in the laboratory.

July 7, I boiled the solution which had been used with the meats and fish, and removed the scum that rose to the surface. When cold, I added about two ounces of viandine, and poured the solution into a stone jar containing one pound of mutton-chops and one pound of liver.

Tabular statement of experiments with 'Rex magnus.'

July.	Temperature.	Beef-steak.	Veal.	Mackerel.	Liver.	Mutton-chops.	Roasting piece of beef.	Leg of mutton.
5	86°	Placed in solution.	Placed in solution.	Placed in solution.	– –	– –	– –	– –
6	85	Taken from solution.	Taken from solution.	Taken from solution.	– –	– –	– –	– –
7	84	No odor.	No odor.	No odor.	Placed in solution.	Placed in solution.	– –	– –
8	73	No odor.	No odor.	No odor.	Taken from solution.	Taken from solution.	– –	– –
9	70	No odor.	No odor.	No odor.	No odor.	No odor.	– –	– –
10	72	No odor.	No odor.	No odor.	No odor.	No odor.	– –	– –
11	71	No odor.	No odor.	No odor.	No odor.	No odor.	– –	– –
12	79	No odor.	No odor.	No odor.	No odor.	No odor.	– –	– –
13	78	No odor.	Slight odor.	No odor.	No odor.	No odor.	– –	– –
14	79	No odor.	Slight odor.	No odor.	Leathery look, slight odor.	No odor.	– –	– –
15	79	No odor.	Slight odor.	No odor.	Slight odor.	No odor.	– –	– –
16	77	No odor.	Odor.	No odor.	Slight odor.	No odor.	– –	– –
17	80	Eat a piece, palatable.	Odor.	No odor.	Odor.	No odor.	– –	– –
18	79	No odor.	Odor.	No odor.	Odor.	No odor.	Placed in solution.	Placed in solution.
19	73	No odor.	Odor.	No odor.	Odor.	No odor.	– –	– –
20	74	No odor.	Odor.	No odor.	Odor.	No odor.	Taken from solution.	Taken from solution.
21	76	No odor.	Very disagreeable.	No odor.	Thrown away.	No odor.	No odor.	No odor.
22	79	No odor.	Strong odor.	No odor.	– –	No odor.	No odor.	No odor.
23	75	No odor.	Strong odor.	No odor.	– –	No odor.	No odor.	No odor.
24	77	No odor.	Thrown away.	No odor.	– –	No odor.	No odor.	No odor.
25	76	Slight odor.	– –	No odor.	– –	Slight odor.	No odor.	No odor.
26	79	Tasted a piece, not palatable.	– –	No odor.	– –	Tasted a piece, not palatable.	Slight odor.	Slight odor.
27	77	– –	– –	No odor.	– –	– –	Cooked, did not dare to taste, odor very strong.	Odor stronger.
28	75	– –	– –	Eat a piece, palatable.	– –	– –	– –	Cooked, odor so strong I could not remain in the room.

NOTE. — The temperature is the mean of three daily observations taken at about nine o'clock A.M. and three and ten P.M. The laboratory in which the meats were placed was well ventilated, and protected from flies and insects by wire screens. One pound of the viandine used was obtained from the office of SCIENCE, the rest by express from the Boston office of the company.

July 8, I took the mutton and liver out of the solution, allowed them to drain, and placed them on plates in the laboratory.

July 13, the plate in which the liver had been placed was nearly full of a red-colored liquid, and the liver had a hard leathery appearance. The liver and veal had both acquired a slight odor. The other meats and fish smelled sweet.

July 16, the odor of the liver and veal had become stronger than on July 13. The liver was placed on a clean plate, as the first plate was full of the red-colored liquid. The beef, mutton, and fish still looked and smelled fresh.

July 17, I had one-half of the beef-steak which had been treated with the viandine solution on July 5 cooked for breakfast. It was tender and palatable: still, it was not like a fresh steak. There was a slight taste of borax; and there was also a want of flavor, something like what fresh beef-steak might have if it were washed with cold water before cooking. Poured a little viandine solution over the veal and liver.

July 18, a roasting piece of sirloin beef,

weighing five pounds, also a leg of mutton weighing four and one-half pounds, — being first punctured in a number of places, especially in the neighborhood of the bones, with an iron skewer, — were placed in two gallons of the viandine solution made up like the solution of July 5. The liquid was in a stone jar, and completely covered the meats.

July 20, the beef and mutton, which had remained in the viandine solution thirty-six hours, were removed, allowed to drain for two minutes, and placed on plates in the laboratory.

July 21, I was obliged to throw away the liver, the odor being very offensive. The veal had a disagreeable odor. A few mould-spots were removed, which had appeared on the steak. No odor, however, was perceptible. The mutton-chops and fish also smelled fresh. Placed steak and mutton in viandine solution for one half-hour.

July 24, it became necessary to throw away the veal. Beef-steak, mutton-chops, mackerel, roasting piece of beef, and leg of mutton appeared fresh.

July 25, the beef-steak and mutton-chops smelled slightly old.

July 26, I had the remaining half of the beef-steak which had been treated on July 5, and the mutton-chops which had been treated on July 7, cooked for dinner. No odor was noticeable; but they had a very high taste, so much so as to be unpalatable, save to a starving man. The roasting piece of beef and the leg of mutton smelled slightly. The mackerel appeared and smelled fresh.

July 27, the mackerel, which had remained in the laboratory since July 5, was cooked for breakfast. It was fresh and fairly good, like mackerel that are served at the average hotel table. There was no taste of borax. The roasting piece of beef was to be served for dinner. On cooking, a very offensive odor was given off. An examination showed a small piece near the bone that had become decayed. The rest of the beef appeared good; but pieces cut from different parts all had a strong odor of putrefaction. The mutton in the laboratory had a perceptible odor.

July 28, the mutton was cooked for dinner; but, when placed on the table, the odor was so strong that I could not remain in the room.

The results obtained from the above experiments seem to show, that pieces of meat having large surfaces in comparison to their thickness, as steaks and chops, and also small fish, can be kept a considerable length of time, although with some deterioration in taste, by the use of the viandine brand of Rex magnus. In the case of larger pieces, such as a roasting piece of beef, or leg of mutton, having tried only two experiments, I do not care at this time to speak positively. I can, however, state, that I should have some hesitation in again allowing to be cooked in the house large pieces of beef and mutton that had been kept in a warm room for ten days after treatment with the solution of viandine.

LEONARD P. KINNICUTT.

Worcester free institute, July 28, 1883.

THE IGLOO OF THE INNUIT.[1] — V.

As the spring wears on, and thawing weather comes, the igloo falls into a decline; and when an exposed place can be found to pitch the seal-skin tent, it is abandoned. Before this can be found, however, the igloo assumes a new combination phase, which must be described. When several igloos have fallen in and buried their contents (the women, babies, and puppies managing to wriggle out, and a good share of the things being lost in the *débris* of snow-banks), the Innuit ceases to build any thing more than the walls of snow, using the prospective tent for a roof; this being the same as the autumn igloo, excepting the body, which is of snow, and not of ice. This phase of the igloo is so well shown in the illustration on the next page, taken from the German book of a member of my party, Mr. Klutschak, entitled '*Als Eskimo unter den Eskimos*,' that I transfer it to this article. His sketch of our spring igloos was taken on Cape Herschel, King William's Land, on the 16th of June, 1879, — the day before we abandoned them for the summer, and moved into tents.

The tenacity of some igloos, however, before they tumble in, is truly wonderful. They always give ample warning by slowly sinking on the top and side towards the sun or warm wind; and this the inhabitants counteract by thrusting a pole from the inside through the dome at its most threatening point, and there firmly lashing several small cross-pieces to prevent further sinking, which it will do if not too warm, or some small dog with bone in mouth, and pursued by a larger, does not take refuge on top, as is their wont, — when the snow-dome, dogs and all, come tumbling in on the heads of the hyperboreans. The foot of this pole rests on the floor, hardened by tramping, or a board is put under it to give it support. I have, however, seen a high-domed, abandoned

[1] Concluded from No. 31.