

the water repeatedly and drank. Presently B imitated him, and he too drank repeatedly. Both pecked at white of egg held in forceps, seizing at about the third shot, but shook it out of the bill. Perhaps some was swallowed. I then put them to bed in their basket.

Two hours later they were taken out and waddled about with more accuracy of motor coördination. When they came to the water they both at once drank. They pecked at white of egg placed on a black tray to make it more conspicuous, but shook it out of their bills.

After another two hours A was dropped into a fairly deep bath. He floated and kicked vigorously, dropping excrement. In less than a minute he swam round and round the bath and pecked at marks on the side.

A little later both made for the tin of water and sat in it. They pecked with more accuracy and without suggestion (i. e., moving it about with pin) at white of egg on the tray, still shaking the head vigorously, but swallowing freely. A scratched his head two or three times, but tumbled over in the process.

Later in the evening of the same day they ate white of egg freely. The pecking coördination was much more accurate, but not quite accurate. I placed B in the bath. He kicked excitedly and dropped excrement; then swam about vigorously, pecking at the sides.

Next morning when taken from their basket both A and B made for the water in their tin and drank and sat in it. They ate keenly of white of egg, swallowing large morsels. Both scratched their heads occasionally, tumbling down. Both preened their down, rubbing their bills over their breasts. They applied their bills to the base of the tail and rubbed their heads along their backs in the most approved duck fashion. They stood up and clapped their downy winglets, toppling over backwards on to their tails from imperfect coördination.

In the middle of the day I placed a blue-bottle fly, from which the wings had been snipped off, near them. A followed, pecking at it, but failed to seize. It escaped under the newspaper which formed the floor of my yard. I routed it out. A again followed pecking, but the fly escaped through the wire netting. I placed it again in the yard. A followed and caught it at the third peck, swallowing it apparently with satisfaction. Put A in the basket. B then caught another fly after numerous abortive attempts.

Both A and B ate their own excrement and that of chicks, showing less signs of dislike than do chicks.

Tried the ducks with all sorts of odd things, bits of paper, chopped-up matches, leaves, flowers, small stones, red currants, anything of suitable size I could lay hands on. Each was seized and mumbled, and then either rejected or swallowed.

When three days old I threw to them the yellow and black-banded caterpillar of the cinnabar moth. Each seized it, but dropped it at once. Very soon no notice was taken of it. Next day on repeating the experiment A seized a caterpillar, but dropped it. B took no notice. They ate freely of green caterpillars from gooseberry bushes, and distinguished between these nice morsels and the nasty yellow and black caterpillars. They ate tadpoles placed in their water, noticing them directly they began to swim about.

I daily placed for them at about 9 A.M. in my experimental yard a large black tray with a shallow tin of water. To this they at once ran and drank, sitting in the water and washing. On the sixth day I put down the tray and tin as usual; but the tin was empty. They ran to it, went through all the action of mumbing the water and drinking. They sat in the empty tin wagging their little tails and ducking down their heads as if they were enjoying a good bath. They continued this procedure for about ten minutes. I then gave them some water. The next morning I repeated the same experiment, but though the ducks searched for water with their bills they did so with less vigor and zest.

A winged bee was thrown in. B seized it, but dropped it. A seized it, and after mumbing it for a moment, swallowed it. Possibly he was stung. He kept on scratching the base of his beak first on one side then on the other and seemed uneasy. But he was all right again in half an hour. There was no *instinctive* avoidance

of bees. Subsequently he would not touch a bee. There was an *intelligent* avoidance of bees. Nor would they touch the bee-like fly, *Eristalis*. Its mimetic form served as a protective character.

Subsequently A seized a humblebee and after mumbing it in the water swallowed it and seemed none the worse.

The above jottings are extracted from my note-book and are given without comment. I may add that as compared with chicks the ducklings show less intelligence and develop psychically more slowly. Their greediness and vulgarity are painful to observe and to contemplate.

BACTERIA IN HEN'S EGGS.

BY MELVIN A. BRANNON, FORT WAYNE, IND.

THAT cider should turn to vinegar and milk become sour excites little wonder among common people or even individuals of considerable education. The mere statement of fact in such ordinary phenomena seems to satisfy the masses, but fortunately for scientific and sanitary interests, there is a class of individuals persistently questioning such phenomena till reasonable explanations are secured. Consequently the souring of cider and milk was found to be caused by the presence of organisms which produced acetic and lactic acids, respectively, whenever the proper medium was exposed in an atmosphere of moderate temperature.

Not only have these common but interesting phenomena, "souring" of cider and milk, been explained by the presence of bacteria, but many other phenomena, less common and more concealed, have been directly traced to the action of some form of bacteria associated with the matter in which the phenomena occurred.

Of course, no intelligent student holds bacteria responsible for every chemical change in organic matter, but it is well understood and universally admitted that the greater number of chemical changes in living and decaying organic material are induced by some bacterial form.

Recognizing the importance of recording every phenomenon relating to the presence and action of bacteria, it seemed proper to recite to readers of *Science* some of the details in a very peculiar case recently noted.

An acquaintance whose intelligence and acuteness of observation make his testimony thoroughly reliable, stated that one of his Plymouth Rock hens was laying eggs, every one of which had an unpleasant odor, although broken a few hours after it was laid. He also said that the hen was laying regularly and appeared healthy in every respect save that she had the gaps. A few days succeeding this statement he reported the fowl butchered and closely examined. In her craw was found a ball of threads pulled from manilla matting which she had access to. The ball entirely filled the craw and was very hard and compact, except in the central region, through which ran a cylindrical opening, affording a passage-way for the food. This ball of manilla threads and the craw gave the same offensive odor as did the eggs when broken. The heart, liver and digestive apparatus—excepting the craw—were normal in size and appearance.

A perfect egg was taken from the hen and personally examined. It looked and smelled like a perfectly fresh egg, but when broken it gave forth the same disgusting odor that had characterized her craw and previously laid eggs. This odor was exactly like that observed in decaying meat, and, had the broken egg been concealed, any person entering the laboratory would have suspected that decaying meat was exposed in that room.

The egg contents gave a strong alkaline reaction when tested with litmus paper. The general appearance of yolk and white was normal, but a portion of albumen mounted and carefully observed under the microscope, magnification 250 diameters, revealed the presence of a great number of bodies varying in shape from almost round to distinctly oblong. These forms closely resembled bacteria, but lack of time for tests and cultures made the determination of them impossible.

From these few observations and experiments it would be unscientific to definitely conclude that these eggs were decaying from the action of bacteria, but in view of the fact that the odor so closely simulated that of decaying flesh and that the egg con-

tents were strongly alkaline, which would favor the development of bacteria, is it not exceedingly probable that this fowl had clogged her craw and set a great culture of bacteria developing there, till at length bacteria had gained admission to the oviduct through the blood and thus developed infected eggs?

This rather brief description in no wise pretends to explain this phenomenon. It has been given with a dual hope: First, that some bacteriologist whose experience has familiarized him with similar cases may give the desired explanation of how these bacteria, if they were bacteria, gained admission to these fresh eggs; second, that the attention of physicians and officers of boards of health may be attracted to this subject.

There is evidently as much necessity for caution in feeding hens as in feeding milk cows or in fattening beeves and swine. Chickens should not be fed all sorts of refuse matter and then be expected to return therefor good healthy eggs and meat. Yet we all know the universal practice in small cities and villages, where many of the market fowls and eggs are obtained, is to give over the office of scavenger to the feathered inhabitants. If the subject were properly regarded by physicians and the people were rightly educated, we might look for better things; till then the occurrence of such peculiar phenomena as the one related and even more unique, should not surprise scientific students.

A MALAY FIRE-SYRINGE.

BY F. W. RUDLER, MUSEUM OF GEOLOGY, LONDON, ENGLAND.

By the kindness of my friend Mr. Henry Louis, the well-known mining engineer, who has recently returned to England from Singapore, I have received a fire-syringe which he obtained towards the end of 1890 from a part of the Malay Peninsula never previously visited by a white man. So far as I can ascertain, the use of the fire-syringe has not been hitherto recorded from this locality. Mr. Walter Hough, in his admirable description of the fire-producing appliances in the United States National Museum, published in the Smithsonian Reports for 1888 and 1890, refers to the syringes of Borneo and Burma, but makes no reference to those of the Malay Peninsula. No syringe from this locality is to be found in the very extensive ethnographical collections in the British Museum. Moreover, Mr. A. R. Wallace does not know of its use by the Malays, nor is it known to Professor Terrien de Lacouperie, who has lately written on the production of fire by the Chinese in his *Babylonian and Oriental Record*.

Mr. Louis obtained the specimen in question from a Malay who stopped with a party of others at his camp on a small stream known as Ayer Katiah, one of the tributaries of the River Teluban, on the southeast coast of the Malay Peninsula, and about 100 miles from the mouth of the river. The district is sparsely inhabited by Malays, and the party from whom the syringe was obtained had come from some of the neighboring Kampongs. They squatted down and began smoking, one of the men lighting his cigarette in the most matter-of-fact way by means of his fire-syringe. There is no reason to suppose that he was singular or had imported his apparatus from a distance. If the rest of the party elicited sparks by means of quartz and iron it was, they admitted, simply because they preferred this method as being less troublesome and more trustworthy than that of compressing air.

The Malay syringe consists of a tube of hard wood 2½ inches long, closed at one end, towards which the tube slightly tapers. It is surrounded with neatly plaited strips of thin rattan which, while they ornament the object, serve also to strengthen it and prevent the wood from splitting longitudinally in the direction of the fibre. The piston is made of similar wood and is packed with string. The tinder was carried in the hollowed-out skin of a large bean, like the seed of *Entada*.

In order to use the instrument a small piece of dry tinder is placed in the slightly hollow end of the piston and pressed down to keep it well in place; the piston is then inserted in the cylinder, smitten sharply with the palm of the hand and very rapidly withdrawn, when the tinder becomes sufficiently heated to slightly smoulder, and by then gently blowing it a bright glow may be obtained. According to Mr. Louis, the native never

seemed to fail in his use of the syringe, but the knack is not easy to acquire, and those who have employed a similar apparatus for demonstration at physical lectures know that it is far from easy, even with a well-made instrument, to ensure success.

Contrary to what might have been expected, it was rather a young man who preferred this strange mode of producing fire to the more convenient flint-and-steel method. There can be no doubt that the use of the fire-syringe, never widely spread, is rapidly dying out, and hence every fact bearing on the geographical distribution of so curious a custom deserves to be put on record.

L'ORIGINE DES ARYENS.

PAR LE PROF. G. DE LAPOUGE, UNIVERSITÉ DE MONTPELLIER, FRANCE.

LES revues scientifiques et *Science* en particulier ont publié cette année une quantité d'articles qui avaient la prétention d'éclaircir la question aryenne, mais qui me paraissent avoir surtout produit le résultat inverse. Il me semble que l'obscurité vient surtout de ce qu'on ne s'entend pas sur la valeur de mots qui, détournés de leur signification primitive, sont maintenant bien près de n'en avoir aucune, tant elle devient vague. Partisan très actif de l'origine européenne et occidentale de la race blonde et de son identification avec les premiers auteurs de la culture aryenne, j'ai contribué sans le vouloir à créer cette équivoque. Je voudrais arriver à la dissiper.

Le titre d'Aryens est historiquement applicable aux Indo-Iraniens seuls. Ceux-ci étaient loin de former la partie la plus pure, au double point de vue morphologique et sociologique, de la race que nous appelons aryenne. C'est pourquoi je crois préférable de laisser le terme d'Aryen à l'histoire et à l'ethnographie, et de lui conserver son sens strict, plutôt que de continuer à l'étendre comme on l'a fait, d'abord en philologie d'un sous-groupe à un groupe entier de populations parlant des langues apparentées et pratiquant des coutumes analogues, et ensuite en anthropologie à la race qui paraît avoir joué chez ces peuples le rôle de ferment. En regardant comme démontré ce qui est encore discuté, à savoir que les langues et les idées aryennes sont nées dans une tribu ou dominait la race blonde et sous l'influence de son génie propre, faire remonter d'une partie des peuples conquis au premier noyau des conquérants un nom ethnique plus récent d'un nombre considérable de siècles, c'est à peu près comme si l'on voulait dans dix mille ans appeler les Français d'aujourd'hui Dahoméens, parce que l'Afrique serait en grande partie devenue, c'est une pure hypothèse, française de mœurs et d'institutions.

Il conviendrait de s'entendre pour adopter désormais dans le langage précis la terminologie suivante: Aryens, les Indo-Iraniens primitifs; langues aryennes, institutions aryennes, les langues et les institutions de ces peuples et de leurs descendants immédiats; Indo-Européens, les peuples, d'origine quelconque, qui ont fait usage de ces langues, et de ces institutions, mais à partir seulement du moment où cet usage a commencé chez eux. La terminologie ainsi rétablie, on arrive à s'apercevoir que le problème aryen n'existe pas et qu'il y avait simplement logomachie. On se trouve en face des questions suivantes, aux quelles il est plus facile de répondre dès que l'esprit n'est plus tirailé par les acceptions multiples et discordantes des termes.

Quel a été le berceau des langues et des institutions indo-européennes? Question d'histoire et de philologie, à laquelle on est actuellement porté à répondre: l'Europe.

Ces langues et ces institutions paraissent elles avoir été particulièrement propres à certains peuples caractérisés par la prédominance d'une race, et laquelle? Autre question d'histoire et de philologie à laquelle on est obligé de répondre: oui, la race dolichocéphale blonde. En effet il n'y a pas de peuple ou cette race domine qui fasse usage de langues ou d'institutions non-aryennes, tandis que les peuples ou cette race ne domine pas font en partie usage de langues ou d'institutions d'un autre groupe, en ont fait usage à une époque historique rapprochée (partie de la Russie et de l'Allemagne), ou paraissent en avoir fait usage dans l'antiquité (Gaule, Espagne).

L'évolution qui a produit ces langues et ces institutions a t'elle eu pour point de départ un peuple ou la race blonde avait la