Curing the flock. The use of healing waters in Roman pastoral economy

by

Barbro Santillo Frizell

With an appendix by Kenneth F. Kitchell, Inscription CIL XIV, 3911 from Aquae Albulae, Tivoli

Abstract:
The Roman physicians were well aware of the medicinal properties of mineral waters and used them frequently for treatment of human beings. The aim of my paper is to investigate evidence for the use of these waters, in particular those containing sulphur, as a resource in ancient veterinary medicine. Furthermore, the role of sanctuaries associated with healing waters in the context of animal husbandry, in particular sheep-breeding, is discussed. On the basis of textual, archaeological and ethnographical evidence, I argue that treatment with sulphurous water was an important therapy against some epizootic diseases and other illnesses which were a constant threat to sheep-farmers. The presence of sulphurous water in areas exploited for large scale transhumance should therefore have been an important factor which conditioned keeping such large herds of animals, as was used. This issue has not been given attention previously in studies of pastoral economies in the Graeco-Roman world, although this geological phenomenon is present overall throughout present the Mediterranean basin.

It was during a landscape survey in the hinterland of Campania (ancient Hirpinia) when I first got the idea to investigate the relationship between sulphurous waters and animal husbandry, in particular the large-scale transhumance economy. I then visited the sanctuary of Mephitis in Val Ampsanctus. This place was already famous in Roman times for its sulphurous waters, which Virgil in analogy with the Lake Avernus in the Golf of Naples, associated with the underworld. In ancient times important cattle-trails passed not far from the sanctuary. The frequency of the visitors at the sanctuary probably coincided with seasonal migrations.

In order to verify my hypothesis regarding the role of sulphurous springs in the pastoral economy, I have proceeded along several lines of investigations, using a method which combines ancient texts, archaeological finds, topography, ethnographical analogies and modern veterinary medicine.

The ancient texts of primary importance are the Roman agricultural treatises by Cato, Varro and Columella, Pliny and Vitruvius on natural history and the properties of different waters, and Strabo on topography. The Latin poets are also valuable sources. Virgil’s pastoral poetry, and in particular, his Georgica contains much useful information, much of which had been gathered from other sources.

The geography

The geographical setting which is mandatory for transhumance on a large scale is of a complementary character including both mountain areas and coastal plains. The Apennine mountain range runs like a dorsal spine through the Italian peninsula and constitutes an important resource for animal breeding on large scale. The Apennine highlands were exploited for summer pastures. In the winter the animals were taken to the coastal plains and wetlands. These grounds were of little value for agriculture, but constituted significant reserves in animal breeding and saltworks, of a multiple usefulness since salt also is an extremely important product in animal husbandry. The early history of Rome is closely associated with the control of the salt production at the mouth of the Tiber and its distribution. Marshes and wetlands constituted the coastal landscape of Rome to the north and south of the Tiber from earliest times until the gigantic reclamation projects during the Fascist era in the 1920, which transformed the Tuscan Maremma and the Pontine Marshes into agricultural land.

One of the large scale transhumance systems that was organized and controlled by the state in Italy during historical times was the Dogana delle Pecore under the Spanish crown of Naples. It was founded by Federico II (1231) and exploited the geographical area from the Abruzzi to Apulia. Another was the Dogana dei Pascoli del Patrimonio di S. Pietro in Tuscia (1289) which covered the area south and north of Rome using the Campagna Romana and the Maremma for winter pasture and the Appenines of Abruzzi, Umbria and Marche for summer grazing. Both were founded in late Medieval period and reorganized almost contemporarily during the 15th century. There is enough archaeological and documentary evidence to show that similar transhumance systems functioned in these areas during antiquity, i.e. the Roman period and earlier. The primary economic outcome was the production of wool.
With a metaphor, the Roman aristocrat Varro, himself owner of migrant herds, gives a very clear image of the complementary situation of the geographical spaces highland and plain, which constitute the precondition for the large scale transhumance economy in this part of Italy: “For I had flocks that wintered in Apulia and summered in the mountains around Reate, these two widely separated ranges being connected by public cattle-trails, as a pair of buckets by their yoke.”

Both of these transhumance systems exploited areas of volcanic nature. Dogana delle Pecore passed through the Campanian inland which is rich in volcanic activity in forms of sulphur springs. The Roman campagna and Etruscan landscape is extremely rich in sulphurous springs and mineral waters of various properties and temperatures. That the Romans were very interested in exploring the curative and medicinal properties of these waters is known from textual and archaeological sources.

Curative waters

Vitruvius dedicated a great part in his book *On Architecture* to water and water installations. In a chapter on the nature of different waters, he wrote: “As to the curative power of warm springs, the reason is that the water being thoroughly heated in vitiated soils, takes up an additional and useful quality. For sulphur springs refresh muscular weakness by heating and burning poisonous humours from the body.” Similarly Pliny, with the scientist’s perspective, states in his *Natural History*:

“Sulphur waters, however, are good for the snews, atum waters for paralysis and similar cases of collapse.”

By the time of Augustus, thermal therapy had become fashionable. The interest for this type of treatment is abundantly testified by the numerous thermal buildings and sanctuaries in connection with important springs all over the Empire. Most of our source material belongs to this period or later.

The area of Tivoli, ancient *Tibur*, famous for its water cascades and luxurious villas, is also extremely rich in sulphur. There were four lakes with sulphurous water below the sanctuary of Hercules – the *Aquae Albulae*. They were famous for their therapeutic qualities in antiquity. References in literary sources from ancient and later periods indicate that these waters were commonly used for curing muscular and rheumatic illnesses. In his *Geography* Strabo wrote:
The health of the flock

We should assume that man, already from the beginning of animal domestication, had acquired vast knowledge of animal breeding and behaviour through experience and observation. The insight into animal anatomy gained by ancient man through sacrificial slaughtering should not be underestimated. During these rituals, the meat of the butchered animals were carefully cut into pieces and distributed according sacred rules. Reading portents in the entrails was an important instrument for augury in the Near Eastern and Etruscan cultures. The famous Etruscan hepatoscopy which consisted in reading sheep livers was taken over by Romans who made it part of their standard sacrificial procedure. Certain observations were made which reflected empirical knowledge at least on a parascientific level. Ancient Greek veterinarians also practised dissections, which gave much information on animal diseases and pathology.

The importance of the quality of pasture for ruminants was well known in antiquity. In his chapter on pasturage, Varro wrote with deep empirical knowledge on where, when and how to pasture the sheep. In a beautiful phrase, Virgil has transferred into poetry some of his advice: …

"Let us haste to the cool fields, as the morning-star begins to rise, while the day is young, while the grass is hoar, and the dew, on the tender blade most sweet to the cattle."

The geochemical status of pastures is a very complex issue even today and it is well known that sheep are very selective in their choices. The health of grazing animals is dependant on the quality of the herbs and plants and their mineral contents. If the geochemical conditions are good, the grazing grasses contain enough life-important elements in well balanced proportions and if the pasture areas are abundant the sheep regulate a proper intake by themselves. In antiquity, if the pasture was limited, the shepherd drove his animals to good pasture and in particular situations, when the ewes had lambs or when the sheep were sick, complementary fodder was given. In the Fasti of Ovid the shepherd sings to the pastoral goddess Pales in the occasion of her festival:

"If my pruning-knife has robbed a sacred copse of a shady bough, to fill a basket with leaves for a sick sheep, pardon my fault."

The health of the flock was of major concern for the owners, which reflect the economic importance of these investments. Bodson argues, in an article on the welfare...
of domestic animals, that the constant worries about animal well-being “was not inspired only by a search for material profit” and “inspired by philosophy, ethics, religion, or by spontaneous feelings, people were taught from childhood to care for animals, especially the tame and domestic species”. I think that this picture, based on philosophical and literary writings is too idealized and that it does not describe the situation for most people who depended economically on livestock. The attitudes towards domestic animals depended rather on basic economic conditions. Farmers and herdsmen who were living very close to work animals on smaller farms in subsistence economies, surely created very particular bonds and feelings towards the animals. Ethnographic material gives ample evidence for very close relationships between man and his work animals. Cows and horses in particular, but also goats and sheep, were often given individual names. The loss of an animal could cause a great grief, comparable to losing a family member. The economic aspect should not be underestimated, however. The loss of a she-goat could mean the difference between life and death for a small child. In the large scale animal husbandry, such as the one Varro took part in with his investments, the relationship between herdsmen and animals was different. Being professionally involved with large flocks means division of labour, which excludes the kind of relationship which was at hand in a subsistence economy with few animals.

In his book on sheep breeding (De Pecuaria), Varro divides the discipline into four areas, pasturage, breeding, feeding and health. With respect to general health he wrote:

“The fourth division is that of health – a complicated but extremely important matter, inasmuch as a sickly herd is a losing investment, and men frequently come to grief because it is not so strong. There are two divisions of such knowledge, as there are in the treatment of human beings: in the one case the physician should be called in, while in the other even an attentive herdsmen is competent to give the treatment. The topic has three heads: we must observe the cause of the several diseases, the symptoms displayed by such causes, and the proper method of treatment to be followed for each disease.”

Here follows a list of factors causing bad health for the animals, such as heat or cold, excessive work, etc.

“Other diseases have other causes and symptoms, and the man in charge of the herd should keep them all in written form.”

Further he writes:

“The head-herdsman is to see that all equipment needed for the animals and herdsmen, and especially for the sustenance of the men and the treatment of the cattle (medicinam pecudum) shall accompany them.”

The writings of Varro show that in his days, sheep-breeding on a large scale required a hierarchy of specialized professionals with strictly defined areas of competence. The head-herdsman, magister pecoris, had to be a literate person with good knowledge of veterinary medicine. There was obviously a distinction between the competence of the head-herdsman and a physician since Varro wrote that when it came to more complicated treatments, specialized veterinarians had to be called upon.

Washing and dipping

In all sheep-breeding cultures the common practice was to wash the animals in fresh water to get rid of external parasites and to remove grease and dirt from the fleece before clipping. I have not yet come across one that has not practised it. How and for which purpose it was performed differed according to the given natural sources and the waters that could be used. To use a fast-flowing stream or a lake is the simplest method. The stream or lake could also be manipulated by dams and channels and thus creating artificial pools to facilitate the procedure. Ryder gives several examples from modern England, where special sheep washes were constructed. He has several interesting examples of sheep wash installations constructed in stone and also in wood, a perish-
The word dipping is a modern veterinary term with a specific meaning which implies bathing the sheep in chemical solutions. It will be used here only for that specific context. Dipping is important still today and preventive dipping methods is still used in countries with important sheep-breeding economies, like Great Britain, New Zealand and Australia, and a variety of chemical and poisonous solutions, are used. Today sheep are dipped in order to eradicate parasites, such as keds, lice and ticks. It is used to check the spread of mange, commonly called “sheep scab” and also to cure it. Further it is used to prevent attack by the sheep-blowflies and consequent infestations with maggots. In England it is illegal not to treat sheep scab and therefore dipping is a widely spread method, practised since 1850. The dips are usually poisonous, such as arsenic-dips and dips containing organophosphates, and thus potentially hazardous both to human and animal health. The procedure must be very carefully handled, so that the sheep don’t drink the water or otherwise get hurt. Various constructions are built to enable the sheep to be submerged in the dips as long as necessary without getting hurt. The constructions are usually circular built basins with a stepped ramp for the animals to clamber out. The man who handles the operation stands on an elevated platform in the middle to avoid to come into contact with poisonous solutions. (Figs. 3, 4). Earlier, when these types of solutions were not available, pastes such as a mix of tar and rancid butter, were used. To treat animals with lime sulphur is also a well documented therapy against sarcoptes and psoroptes-mites, causing “sheep-scab”. It is recommended in all old handbooks in parasitology and the therapy is still used in some places in the USA.

In Italy, sulphur is plentiful. Its volcanic geology has provided this natural resource in vast areas. In order to understand if it was used in traditional animal husbandry I decided to carry out an ethnographical investigation. While asking shepherds of older age, who might have experienced methods that are no longer used, my investigations confirmed the regular use of sulphur until recently, both preventively and therapeutically. One of my informants is the 70 year old sheep-owner Luigi Silvestri (Fig. 5), now stationary with his flock at the site of ancient Tarquinia. He told me that he, as a young boy, assisted his father in the movements of flocks from the summer pasture in Monti Sibillini to the winter grazing pastures in the coastal area around Civitavecchia. There the animals were washed in the sulphurous springs which abound in the area. When I visited the springs at Ficoncella, Civitavecchia, which now are fenced in and used exclusively for humans, I was told that some years ago people brought their animals, in particular dogs and horses, to the baths where the lowest lying basin was reserved for them. The therapy was indicated mainly for skin diseases and wounds. It was later considered unhygienic and now it is forbidden to bring animals there (Fig.6). A similar development can be postulated also for earlier periods, i.e. that the animals gradually became excluded for the benefit of people. It is clear that the sulphurous waters have been an important resource in traditional animal husbandry and their abundance in the landscape offers an explanation to how it was possible to keep such large flocks, as was done in the large scale
transhumance economies, without constant outbreak of epizootic diseases.

We shall now turn back to antiquity to investigate the evidence for the use of similar therapies in sheep-breeding economies. The source material is scattered and fragmentary but unambiguous. It is clear from the writings of Virgil that sheep-scab was treated by letting the animals into water:

"Diseases, too, their causes and tokens, I will teach you. Foul scab attacks sheep, when chilly rain and winter, bristling with hoar frost, have sunk deep into the quick, or when the sweat, unwashed, clings to the shorn flock, and prickly briars tear the flesh. Therefore the keepers bathe the whole flock in fresh streams; the ram is plunged in the pool with his dripping fleece, and let loose to float down the current." and:

"Nay, even on holy days, the laws of God and man permit you to do certain tasks. No scruples ever forbade us to guide down the water-rills, to defend a crop with a hedge, to set snares for birds, to fire brambles, or to plunge bleating flocks into the health-giving stream."

Since washing the sheep according to Virgil was a preventive method against scab the water must have some specific mineral contents. What were then the properties of these waters if they were considered having this curative power? The only natural choice are the sulphurous springs and waters which abound in Mediterranean landscapes and which must have been an extremely valuable resource for ancient man.

Treatments of the animals with sulphur for various purposes is frequently mentioned by the ancient writers. Epizootic diseases were a constant threat to the sheep-farmers. In the Georgica Virgil wrote:

"Not single victims do diseases seize, but a whole summer’s fold in one stroke, the flock and the hope of the flock, and the whole race, root and branch."

Native sulphur was used together with pitch, wax and oil against psoroptic mange, which is “sheep-scab” and foot rot and other skin diseases. The paste was smeared on the infected parts. Sulphur was also used to clean stables by smoking, which is reflected in the rituals performed to the goddess Pales:

"Make blue smoke with pure sulphur, and let the sheep, touched with the smoking sulphur bleat."

In 1733 at Tivoli near the Acquae Albulae a votive stele with an inscription regarding a horse being cured by treatment in sulphur waters was found. The horse was not suffering from scab or other skin diseases but from a wound and a swollen leg. On top of the marble stele there are the remains of sculpted hoofs which show that originally a sculpture of a horse was placed on it. The inscription says that a horse named Samis had been wounded by a boars’ tusk in Roselle and that the wound made his leg swollen. After being cured in the waters of Acquae Albulae, Samis was healed and could start to run again.

From the inscription it is clear that medical treatment in sulphurous waters was practised in Roman veterinary medicine. One would assume that if you bring down a horse all the way from Roselle to Tivoli, which is more than 200 kilometres, the waters were well known and had a good reputation for treatment. In this case it was a horse, Samis, which was cured. Man related differently to horses than to cattle and sheep. A similar inscription would have probably never been written for a sheep – even if a whole flock was cured from, let’s say, scab.

**Healing sanctuaries**

As we have seen, there is enough evidence from written sources to support the hypothesis that sulphurous baths were used in ancient veterinary medicine. We shall now proceed to investigate the connection with these curative waters used for the treatment of animals with sanctuaries. The unique inscription regarding the horse Samis from Tivoli is significant. The waters at Acquae Albulae were evidently sacred since the nymph Lympa dwelled in them and she had also a temple there. On the map of Cabral and Del Re (1779), there is a temple for Faunus, situated close to the lake (Fig. 2). The god Faunus was the protector of the flocks and his presence indicates the
occurrence of sheep and goats. This might indicate that also sheep and goats were washed and dipped in these lakes, not surprisingly given the importance of Tivoli as a cattle market and resting place for flocks and herdsmen. The earliest written document stems from 1363 where the pass at Tivoli is indicated as an obligatory stop for tax collecting.

In the Graeco-Roman world, a range of gods had the function to protect the flock from evil and diseases, in Greece, Apollon, Hermes and Pan, all important gods, held this role. In Italy, particularly in the central Apennine area, Hercules was the god for herds and shepherds. Their sanctuaries are usually built along cattle-trails, markets and springs. Farmers and herdsmen offered vows and sacrifices for their sick animals and also to prevent misfortunes. In a study on the prayers for animals Bodson has shown that occasionally whole states evoked divinities to protect the livestock from diseases and made sacrifices. Epigraphic evidence shows that animals, especially horses, could even be brought to a healing divinity as Asclepios.

Other evidence for sanctuaries in connection with healing of animals is given by Strabo in his description of ancient Daunia, modern Apulia:

"In Daunia, on a hill by the name of Drum, are to be seen two hero-temples: one, to Calchas, on the very summit, where those who consult the oracle sacrifice to his shade a black ram and sleep in the hide, and the other, to Podalirius, down near the base of the hill, this temple being about one hundra stadia distant from the sea; and from it flows a stream which is a cure-all for diseases of animals."

The lowland of Apulia was the most important area for winter pasturage at the end of the transhumance routes which took the flocks from the mountains of Abruzzi and Molise. Important markets and harbours were situated here. That the sacred area of Drium later turned into a Christian sanctuary, the famous Monte Sant’Angelo, is a logical development, given the original function and the importance of this economy.

A passage in the Shepherds song to the goddess Pales by Ovid, also indicate that the presence of sheep in water sanctuaries was not unusual and should in the light of what has been said above, be interpreted as an intentional washing and/or dipping of the animals:

"Count it not against me if I have sheltered my flock in a rustic shrine till the hail left off, and may I not suffer for having troubled the pools (lacus): forgive it nymphs, if the trampling of hoofs has made your waters turbid."

Figurines of sheep, cattle and horses in votive deposits at sanctuaries should be investigated from this contextual perspective. M. Söderlind (in this volume) discusses in his study on human and animal votive figures the reasons for their presence together in the same sanctuaries.

The presence of anatomical parts of animals, in particular hooves, strongly indicates a veterinary/therapeutical function. In the archaeological museum of Cerveteri is exhibited a hoof in terracotta of approximately life-size belonging to a bovine animal (Fig. 7). It comes from the healing sanctuary at Manganello. One of the most frequent problem with sheep and cattle was footrot which brought lameness and it was prevented by smearing the hooves with pitch. Preventive dipping would also have been an effective means to control the disease. Today a regular walk through a footbath containing copper sulphate solution or formalin is recommended.

At Methana, on the east coast of the Peloponnese in the Argolid, a Mycenaean sanctuary with a most interesting deposit of votive figurines has been excavated. In a small room ca. 150 figurines were found, all of which except for one female figurine and a boat model, were animals. Most were simple bovids but also driven oxen and ridden oxen were represented. Horses in groups, or single horses, ridden or driven in chariots, were plentiful. The composition of the votive deposit is unique in showing such a variety of domestic animals in situations showing them working for man. The animals, big cattle and horses, are of high status and economic importance.
This is a significant feature in the deposit and has bearings on its interpretation. The excavator, E. Konsolaki, proposes a religious context of transcendental character, attributing this symbolic function to the animal figurines. I think that the prime function of this sanctuary has a purely utilitarian use related to animal husbandry. This does of course not exclude religious connotations, which are everywhere present in ancient societies. I interpret Methana, which still today is frequented for its curative hot springs, as a prehistoric healing center for animals, the most important and expensive ones being reflected in the votive offerings. All evidence points to this direction. This explains also the isolated location of the sanctuary on the east coast of Methana distant from the prehistoric settlement on the acropolis, which has puzzled the excavator. Indeed the reason for its location must have been due to the location of the healing waters which were situated close to the sanctuary.

To conclude, with this different vision, new insights could probably be obtained from other sanctuaries with water installations, such as basins, ramps and other devices which could be investigated with these functional aspects in mind. Our preconceptions are as always our worst enemies. We have created dichotomies between profane/utilitarian and sacred, between human and animals, based on our own experience. As an example we can look at a picture on a wall painting from Pompeii (Fig. 8). The image is an idealized representation of a pastoral idyll, a mode reflecting the diffusion and popularity of Virgil’s pastoral poetry. The interest in this type of literature and artistic representations during the Roman period should, I think, in analogy with a similar popularity for these motives during the Renaissance and Baroque be related to the economic importance of animal husbandry and its products and not simply as city dwellers romantic longing for a paradise lost.30

A man is leading a goat to a rural shrine. The situation which immediately comes to mind is an animal brought to be sacrificed. But the scenery could as well depict a sick animal being accompanied by his caretaker in order to deliver a votive offering, a prayer for its health and a dip in the healing waters collected in the basins which are depicted outside the building.

To understand the importance of the preventive and therapeutic aspects in the sheep breeding economy extended collaboration with veterinarians is necessary.31 In Sweden in the 18th century veterinary medicine was ahead of human medicine in several aspects, in particular the knowledge of the spreading of diseases, like cattle-plague. For example, sufficient instructions to avoid the spreading of epizootic diseases were written down by the Swedish veterinarian, Tursén, hundred of years before the nature of infections was known.32 The treatment of the horse Samis at Tivoli was, according to veterinary expertise, adequate even by modern standards – hydrotherapy in tanks is a method very much in fashion today.33

The domestic animals were treated in proportion to their economic value. Ancient man knew that the health of the animal had an influence on the quality of the end product, whatever it was: wool, meat or cheese. It seems that veterinary medicine in many aspects was ahead of
human medicine, which reflects the economic value of the animals, the *pecunia*. Many of the sacred places with particular healing waters were probably used for animals earlier than for humans, as the prehistoric example from Greece indicates, which shows the immense importance of domestic animals in ancient economies.

The use of mineral waters, and in particular sulphurous springs, in veterinary medicine in association with healing sanctuaries has not been given attention previously in studies of ancient pastoral economies. It is a vast subject to be explored overall in the Mediterranean area where large scale transhumance was practiced, especially in Spain, Greece, the Near Eastern countries and North Africa (Fig. 10). Such an approach should enlarge our vision of the complex nature of animal husbandry, transmission and exchange of expertise knowledge.

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Unless otherwise indicated the Latin and Greek quotations are cited from the Loeb Library editions.

1 Trina 1988; Purcell 1996, 180-212; Horden & Purcell 2001, 186-190; Pratesi 2001, 139-159.
2 Pasquinucci 1979, 79-197, gives ample documentation of Greek and Roman authors on the subject, archaeological and epigraphic evidence and historical maps; Corbier 1991, 149-176, focuses on the legislative and organisatorial issues. Regarding the Aragonese reintegration and periods up to modern times, there are a large number of studies. Complete maps of the Royal drove roads (the reintegration maps) and documents concerning legislation and organisation are held at Archivio Stato Foggia and Archivio di Stato di Napoli. Regarding the transhumance systems of the Papal State of Rome the documents are held in the Archivio di Stato di Roma. See Vigueur 1981. For bibliographical references regarding the recent historical periods, see Quilici, 1987, 141-164.
3 Varro, *Rust.*, 2.2.9-11.
4 *Vitr. De arch.*, 8.3.4: Omnis autem aqua calida ideo est medicamentosa, quod in pravis rebus percossa aliam virtutem recipit ad usum. Namque sulphurosi fontes nervorum labores reficiunt percafelaciando exuendoque caloribus et corporibus umores vitiosos.
6 For sacred contexts of water, see Edlund-Berry, I., “Hot, cold or smelly: The power of sacred water in Roman religion, 400-100 B.C.”, in *Numen Adsit*, ed Paul B. Harvey jr. & Celia E. Schultz (forthcoming).
8 *Mari 1983, 295-296. There is no archaeological evidence of a thermal building from the Augustan period and if Augustus took his baths here, he must have done it directly in the lakes or in some wooden device.
12 Van Wörtherghem 1992, 319-337.
16 Varro, *Rust.*, 2.2.7-14.
17 Verg., G., 3.325.
19 At least 15 mineral elements are nutritionally essential for ruminants. The macrominerals are calcium, phosphorous, potassium, sodium, chlorine, magnesium and sulphur. The trace elements, os microminerals, are copper, selenium, zinc, cobalt, iron, iodine, manganese and molybdenum. Radostits, *Blood & Gay* 1994, 1372.
21 Bodson 1986, 246.
23 Varro, *Rust.*, 2.10.5: Magistro providere oportet ut omnai sequantur quern pecorem, quae pecorit et pastoribus opus sunt, maxime ad victum hominum et ad medicinam pecudum.
24 “All directions for caring for the health of human beings and cattle, and all sicknesses which can be treated without the aid of a physician, the head-herdsman should keep in writing.” Quae ad valitudinem pertinent hominum ac pecoris et sine medicino curari possunt, magistri scripta habere oportet. Varro, *Rust.*, 2.10.0.
28 The highly toxic sheep dips can also cause environmental disasters, as solutions have been poured out in watercourses with devastating consequences for the water environment and much effort is being done by the authorities to control the use of it, [www.scotland.gov.uk/library/environment/pepjf08.asp](http://www.scotland.gov.uk/library/environment/pepjf08.asp).
29 Dan Christensson, laborator in parasitology, VMD (e-mail communication). In the Swedish handbook *Den päliliga hastoch boskapstakaren* (The reliable horse- and cattle-doctor), 1847, 67, is likewise recommended sulphur for the treatment of scab.
sed tota aestiva repente, / spemque gregemque simul
cunctamque ab origine / gentem.

35 Radostits, Blood & Gay 1994, 1306.
36 Ov., Fast.: “caerulei fiant puro de sulphure fumi, tactaque
fumanti sulphure balet ovis.”
37 CIL XIV 3911, see Appendix by Kenneth F. Kitchell, p.00.
The inscription is now at the National Museum of Naples.
38 Mari 1983, 17.
39 This attribution, however, is probably influenced by a
comment by Servius (Serv. Aen. 8, 83), who located the spring
of Albunea (Verg., Aen. 8, 81) at Tivoli.
40 Quilici 1984, 159.
41 Bodson 1980, 149-164. See also Bodson 1986, 248.
42 Strabo, 6.3.9-10.
43 Ov., Fast., 4. 756-760.
45 Bodson 1980, 149-164. See also Bodson 1986, 248.
46 Cato, Agr.Orig., 72.
47 www.sheepnet.iofm.net/facts/illnesses.htm.
48 Konsolaki 2002.
49 Konsolaki 2002, 36.
50 Marino 1989, 15-35.
51 At the conference were invited two veterinarians from Sweden
Karina Burlin and Eva Örtenberg. I would like thank them both
for their participation in the discussions contributing with their
professional expertise. In particular I would like to thank Eva
Örtenberg for providing me with much useful information and
for putting her collegial net-work at my disposal.
52 Erland Tursén had the commission of Collegium Medicum to
stop the disastrous cattle-pest. He was active 1750-1765. E-mail
communication from Prof. em. Paul Holtenius.
53 See Appendix by Kenneth F. Kitchell.
54 Asking Dr. Joaquin Gomez-Pantoja of the possibility of the
veterinary use of curative waters in Spain where large scale
transhumance has been practiced at least since the Roman period,
he suggested several sanctuaries where this could have been
practised and where closer investigation should be rewarding
(personal communication).

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Appendix:
On the Samis inscription

by

Kenneth F. Kitchell, Jr

Reconstructed Text

Debilis albuleo steterat qui gurgiti Samis
Articulum medicis ut tenuaret aquis
(Dente quod Aetrusco turgebat saucius apro
Et Russellano forte solutus erat),

Hinc gracies ubi iam nervi tenusque cicatrix
Et celer accepto currere coepit ecus,
Dat tibi pro meritis semet de marmore bonum
Quo mediam gaudes, lympha, subire viam,

Tiburis adversae dominus qua despicit aedem,
Frontibus et pictis Aelia villa videt.

Translation

Samis, the horse had stood, injured, in the pool at Albula

In order to decrease the swelling in his «foot» [articulus] by means of the medicinal waters.

For, once, when he happened to be loose, he was wounded by the tusk

of a boar B of Etruria and of Roselle B, causing his «foot» to swell.

Then, when his tendons grew supple and the scar grew faint, he

Began to run in a most gratifying way and now he gives

You, oh Lympha, in return for your good services, a marble replica of himself, a good thing.

In the place where you delight in going under the middle of the road,

Where the Lord of Tibur that lies opposite looks down on your temple.

And the Aelian villa, with its painted facades, sees this as well.
Comments on the Text and the Cure

It is well to note that the inscription is written in quite acceptable elegiac meter, more evidence of the esteem in which the horse was held.

The nature of the wound, however, remains a bit of a mystery. Samis was clearly wounded in the \textit{articulus}, a frustratingly vague word denoting the point at which one thing joins into another. Thus, the point where a branch attaches to the trunk of a tree or larger branch is an \textit{articulus}. Even a cursory glance at any diagram of the structure of a horse’s leg and foot reveals that many \textit{articuli} offer themselves as candidates. Further, was the wound in the fore limb or the hind limb?

Moreover, a \textit{nervus} can, unfortunately, mean more than merely “nerve” and is commonly used for tendons and sometimes even for ligaments. Yet nerves in the foot or leg area are comparatively small and less prone to being helped by warm bathing. While certainty is therefore impossible, it seems most likely that the blow, delivered by a boar, would be lower rather than higher up the leg and that a tendon such as the Digital Flexor Tendon (roughly analogous to the human Achilles Tendon) or the Digital Extensor Tendon (running down the front of the foreleg) was damaged by the boar’s tusk, swelling and stiffening as a result of the blow.

What then of the cure itself? Both heat and cold are commonly used for such injuries, with cold used to reduce swelling and inflammation and heat to help stimulate blood flow to the area and decrease stiffness. Hydrotherapy, both hot and cold, is commonly used, as is massage.

The cure devised for Samis is, therefore, not remarkable by modern standards. We can as easily see Samis standing patiently in his warm spring as we can a modern horse in its hydrotherapy tank. It is interesting, however, that this sort of cure is not closely paralleled in the ancient veterinary literature known to this author. Several ancient authors wrote works entitled \textit{Mulomedicina} dealing with equine veterinary science. Others, such as Cato or Columella, included such information in broader works on agriculture. I have studied the works of Palladius (4\textsuperscript{th} AD), Pelagonius, Chiron, and Vegetius (4\textsuperscript{th} or 5\textsuperscript{th} AD?) for information on leg injuries and use of water in cures, and have drawn the conclusion that the course of treatment devised for Samis is virtually unparalled in other written sources. This does not preclude, of course, that such courses of treatment existed as popular medicine and were never preserved in written form.

Many injuries to \textit{nervi} are mentioned in the ancient authors. Columella, a first century A.D. source for such matters, and often utilized by the writers to follow, is very close to the mark when he recommends that lameness in oxen can be treated by rubbing the lower extremities with oil and salt but that swollen knees should be rubbed (\textit{fovenda sunt}) with warm vinegar and that sponges soaked with boiling water and smeared with honey can be tied to knees (6.12.1f.). He comes tantalizingly close to Samis’ cure when he recommends (6.30.6-7) that a horse with a sore shoulder can be helped with a swim in a pond.

Palladius (14.12.5) recommends rubbing the knees and knee caps of cattle with oil and salt. Surely the stimulation would increase blood flow to the area and the salt reminds one of the salts in springs such as the one under study here. Palladius also recommends rubbing with warm vinegar (15.12.6), pitch, lard, and sulphur warmed with a glowing bit of metal (14.15.1). Pelagonius (246) recommends cautetization and oil, followed by warm water, for \textit{nervi} of the neck. In passages reminiscent of Samis’ affliction (252, 257-58, 262) he deals with \textit{nervos crassos} and recommends several warm things to soften the thickness but nowhere recommends standing in warm water. In one place he does recommend walking the horse in a cold stream if its knees have swollen due to a long journey (263).

Chiron is quite interested in the \textit{articuli} of horses and advocates the use of heat-producing potions to loosen them up and relieve pain (7.2.581-82; 7.4.587). Vegetius also recommends having the horse swim but includes the ocean or a river as good venues (2.45)

Such beliefs continued well into the Middle Ages. Albertus Magnus, in his \textit{De animalibus}, has a lengthy section devoted to equine medicine. When discussing \textit{ficus}, a growth that may be the same as angleberry, Albert says the following (22.64).

Moreover, if by chance the spot is full of \textit{nervi}, caution should be exercised not to bath the nerve in cold water, because the nerve itself is naturally cold and is turned torpid by the water and putrefies. If it is necessary that the nerve itself be cut, it is better to cut it through rather than to puncture it or crush it with a stone. For the very great pain of a puncture impedes the healing process more than does cutting through it unless it is a case of the large nerves which can not be cut.

The cure for a nerve cut in this fashion should be accomplished with warm things and the spot should be fomented with warm penetrating agents such as oil, lard, and honey, all well cooked. A poultice should be made from the powder of the laurel berry and cumin. It should be mixed with honey and applied and the opening should be kept open until all the pus comes out.

If, however, the nerve is damaged by the blow of a stone, or by the horse’s falling, or should it be impaired and torpid for some other reason, it should first be rubbed forcefully with warm water and warm wood ashes, fomented, and have pressure put on it. It should then be smeared and forcefully rubbed with whatever warm ointment can be found. But if the flesh is wounded and the nerve has been struck and rendered putrecescent, it is useful to apply a poultice over the injury made of bean or barley flour cooked with honey and wine until they thicken.

A poultice made of honey and the roots of dwarf elder \textit{[ehulum]} marsh mallow \textit{[alteca]}, bryony \textit{[brionia]}, and lily, and bound over the injured nerve also
does great good for this. Attention also must be paid if the nerve is cut lengthwise or obliquely, for it is not easily joined and will, perhaps, be impossible to join. When, however, it happens that such an incision has occurred, take the long vermin from the ground called earthworms, grind them well, mix with honey, warm them a bit at the fire and apply them with no other intervening medication. This is of use.  

In summary, the ancients knew very well the benefits of stimulating blood flow to the injured area with heat-producing substances and equally understood the rudiments of exercising the horse in water to take some of its weight off the injured limb while still affording it exercise. To this extent, the cure devised for Samis falls well within ancient parameters. The expedient of bringing the horse to a therapeutic spring, however, remains unknown to this author. What is undeniable, however, is the affection that Samis’ owner had for his horse.

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1 One editor suggests “donum” in a footnote, quoting Inscr. Ital. 596.
2 One editor offers “nitet” (“shines”) which makes better Latin but is probably indefensible.
3 Perhaps: “as a gift” if we read “donum.”
4 I wish to thank Prof. Rex Wallace of University of Massachusetts, Amherst, for his generous help with certain aspects of this inscription. I am indebted to Dr. Elizabeth Gatti, DVM, for reviewing the manuscript and for her insights on equine anatomy and treatments.
5 An interested reader is referred to Stashak 2002, the standard work on the subject of injuries to horses’ feet and legs.